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AGRICULTURAL MARKETING IN INDIA

Report on the MARKETING OF WHEAT IN INDIA

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INTRODUCTION✓

This is the beginning of a series of marketing surveys as recommended by the Royal Commission on Agriculture in India. Further reports will issue shortly dealing with other important products such as rice, linseed, groundnuts, tobacco, fruits, milk, eggs, hides and skins, livestock, etc., and with special surveys in regard to Markets and Fairs and Co-operative Trading. The work of marketing investigation began in 1935 and has since then been carried on throughout the whole of India—both provinces and States. The present report is the first fruit of these All-India investigations and attempts to show as concisely and clearly as possible the essential facts regarding the marketing of Indian wheat, with the ultimate object of obtaining better prices for the cultivators.

Obviously in any attempt to raise growers' prices there is a limiting factor, namely, the price consumers are prepared to pay. This is especially so in India where millions of consumers—including growers themselves—readily switch over from wheat to barley or gram in some districts and to rice, millets or maize in others if the price of wheat is relatively high.

In countries which are largely dependent on imported food grains and where the people are, by custom, incapable of changing over from a wheat diet it is possible, by restricting imports, to put the local producers in a quasi-monopolistic position to command higher prices. Such a course is obviously impossible in India. If the wheat grower here is to obtain a higher price it can only be done by getting for him a larger share of the price which the consumer pays. This involves a reduction in the costs of distribution which can only be,

effected by making the machinery of distribution more efficient. The main function of this report therefore is to provide a basis for constructive action by assembling in a systematic way a sufficient body of accurate information on the subject.

To collect and sort all the essential facts regarding wheat production, distribution and consumption throughout the whole Indian sub-continent has been no light task. At many points the fundamental statistics were found to be lacking or doubtful in their accuracy. At other commonly accepted points were found to be at variance with facts. Much new ground had to be broken especially in the study of consumers' requirements. The extent to which the immediate objectives of the survey have been attained readers of the report must judge. It will, at any rate, be seen from the report that the present system of distribution is, in many directions, very wasteful and expensive and that there is scope for immediate improvement. Much can be done by growers themselves to improve matters. More can probably be done by merchants and manufacturers who are apparently as a body becoming anxious to improve their efficiency. Finally, something can be done by Provincial Governments, rulers of States and local authorities by way of providing better market places and a proper basis of sale between buyer and seller. The effective standardisation of weights and measures and regulations to ensure fair dealings between all parties whether buyers or sellers are also urgently needed.

Both growers and traders are conscious of these needs and in many places appear ready to support any action taken by the State or local authorities to remedy existing defects. This report will, it is hoped, indicate to all the interests concerned the directions in which they can individually or collectively improve the present system of marketing of Indian wheat.

For the convenience of the general reader and those who wish to obtain a general impression of the report before studying it in detail the principal facts and conclusions have been summarised in the " Inter chapters " (at pages 54, 71, 115, 123, 172, 197, 226, 248, 286, 316, 336 and 348) and in the final summary at page 355.

The Government of India should not be regarded as assuming responsibility for all or any of the material contained in this report.

OFFICE OF THE AGRICULTURAL MARKETING ADVISER
TO THE GOVERNMENT OF INDIA,

DELHI :

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MAP SHOWING THE DISTRIBUTION OF WHEAT PRODUCTION
IN INDIA



CHAPTER I—SUPPLY.

A.—Note on world trade.

The world production of wheat in 1909-13 including Russia was approximately 100.6 million tons of which India's share was 9.5 millions.* Since then the production of wheat in India has increased to an average of 9.7 million tons (1929-30 to 1933-34) but the world production has risen, particularly in North and South America and in Australia and the average annual world crop in 1930-34 was about 123.2 million tons. This represents an expansion of over one-fifth. India's share of world production had, therefore, fallen from 9.5 per cent. in the earlier period to 7.9 per cent. in the latter. According to the latest available statistics covering the crop year 1935-36 India produced 7.8 per cent. of the world crop.

Exports of wheat were a normal feature of India's foreign trade before the war and in the 5-year period 1909-13 the average annual export of wheat was over 1.3 million tons or nearly 14 per cent. of the average Indian wheat crop. During this period world shipments from principal exporting countries were approximately 13.75 million tons of which India's share was 7.9 per cent.†

In the five years immediately after the war owing to increasing domestic consumption and declining exports, Indian shipments had fallen to less than 3 per cent. of the average crop, while in more recent years the export trade has been almost insignificant. Between 1928-29 and 1931-32 India was a net importer of wheat.

Short crops in leading exporting countries and the liberal use of wheat for stock feeding have combined to reduce world stocks in 1935 and 1936 and have brought about a marked change in the international situation which is reflected in the general rise in the world price level since the spring and early summer of 1936. Prices of Indian wheat have not risen to the same extent, largely on account of ample supplies of complementary food grains, such as gram and barley, with the result that Indian values are again after a period of several years on a level with world prices.

B.—Indian supplies.

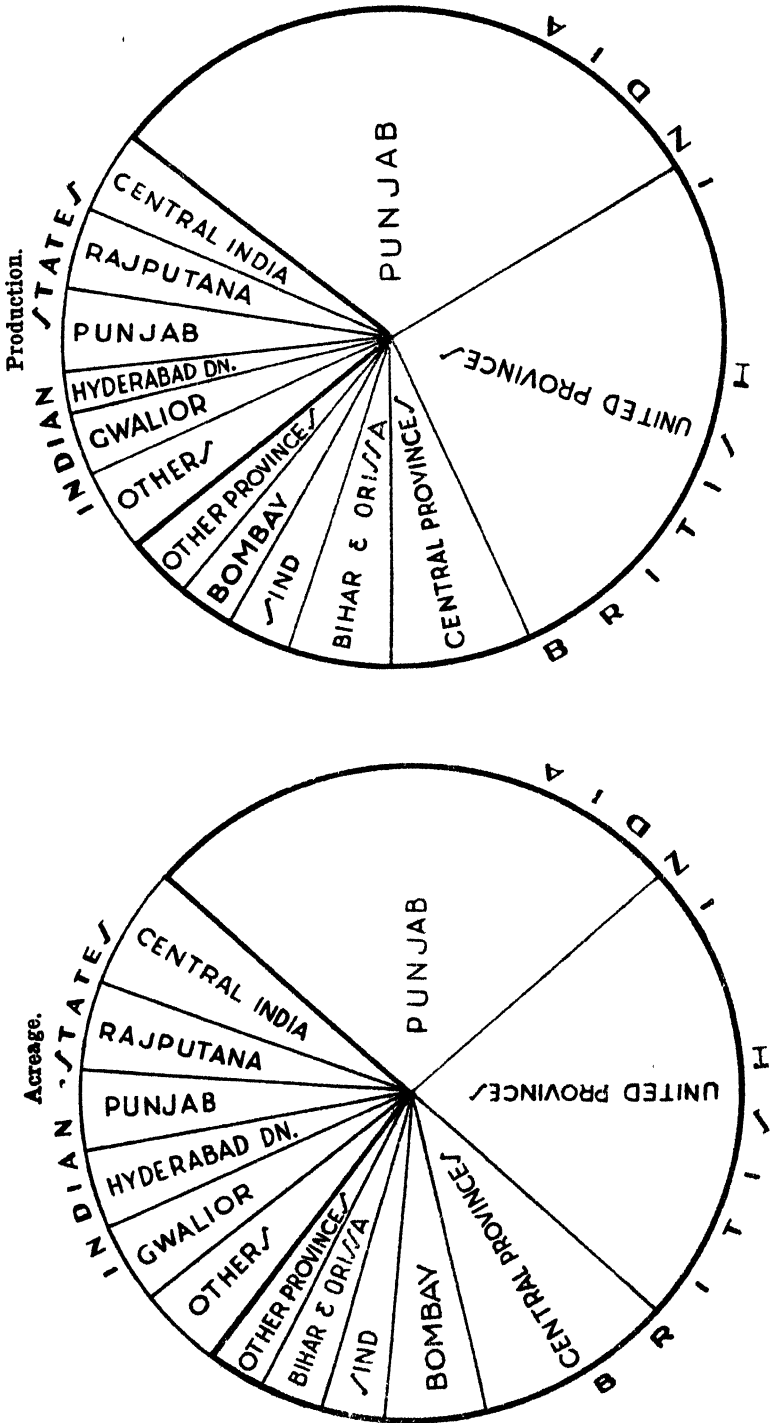
Wheat appears to have been cultivated in India from time immemorial. Grains unearthed from the 3,000 years old ruins of Mohenjo-daro in the Indus Valley have been identified as *Triticum compactum* (dwarf) and *Triticum sphaerococcum*. Wheat of the former type is cultivated to this day in the dry districts of the south west Punjab.

96 per cent. of the total wheat crop is found north and west of a line drawn across the Peninsula from Bombay to Calcutta. It will be observed from the map (on the opposite page) that the areas of concentrated production are the provinces of Sind, the Central Provinces, the Punjab, the United Provinces and Bihar, and the neighbouring Indian States. Production is also of importance in the North-West Frontier Province, Delhi, and Bengal, and further south

* Estimates of Area and Yield of Principal Crops in India, 1909-1910|1913-14.

† The apparent discrepancy between this figure and the average exports noted in the previous sentence is due to the different crop years taken.

SHARES OF IMPORTANT PROVINCES AND STATES IN
ACREAGE AND PRODUCTION OF WHEAT IN INDIA.



in the Central India States. In the Deccan, *i.e.*, the Peninsula proper, wheat is cultivated on a significant scale only in a few districts of the Bombay Presidency and in Hyderabad State.

(1) ACREAGE.

(a) *Total*.—The total area of wheat in India based on the average of the seasons 1925-26 to 1934-35 is 33.2 million acres and represents rather more than one-tenth of the total cultivated area in the country. Three-fourths of the wheat area—approximately 25 million acres—are grown in British India and the remaining one-fourth in the Indian States. In 1935-36 the seeded area was 33.6 million acres.

The average annual production of wheat over the same 10-year period is estimated at 9.3 million tons, four-fifths being produced in British India (Appendix I). The production in 1935-36 was 9.4 million tons.

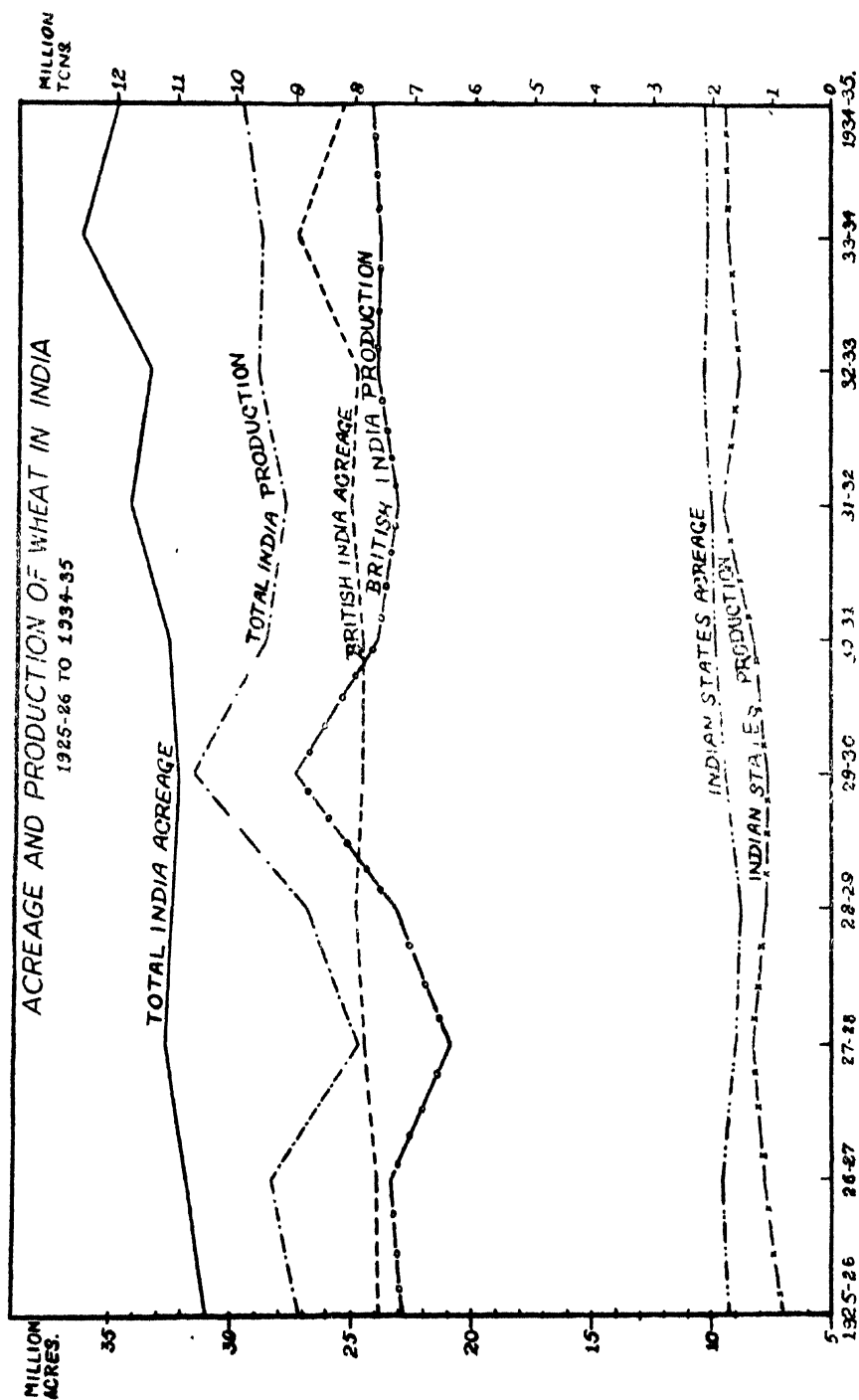
Diagram on page 4 indicates the trend of the acreage and production of India as a whole, and of British India and the States individually, for the past ten years. Appendix II gives the total acreage annually and the acreage in each of the main producing areas for the 10 years ending 1934-35. Taken as a whole, the expansion of acreage in British India has not been large but two provinces show a substantial increase recently, namely, Sind and the United Provinces. Compared with pre-Barrage years the cultivation of wheat in Sind has on an average more than doubled itself. The acreage in the United Provinces rose sharply in 1934-35 but this was to some extent offset by a fall in the Punjab.

The increase in the area under wheat in the States has been fairly steady with the exception of the two seasons 1928-29 and 1929-30 and this expansion has been proportionately greater than the increase in British India. This is partly due to the extension of irrigation facilities in the States of Bikaner, Bahawalpur (Punjab) and Khairpur (Sind).

The share of each important province and State is illustrated in Diagram on page 2 and the following table shows the relative importance of the chief areas based on the average of the 10-year period 1925-26|1934-35.

Average area under wheat.

	Million acres.	Percentage of total area in British India.	Percent- age of All-India acreage.
British India—			
Punjab	9.4	37.6	28.2
United Provinces	7.5	29.9	22.6
Central Provinces	3.4	13.7	10.2
Bombay	1.6	6.4	4.8
Sind .. .. .	.6	2.8	1.8
Other provinces	2.4	9.6	7.2
Total British provinces	24.9	100.0	75.0



	Million acres.	Percentage of total area in Indian States.	Percentage of All-India acreage.
Indian States—			
Central India States	2.0	24.2	6.0
Gwalior	1.3	16.0	3.9
Hyderabad	1.2	13.7	3.6
Punjab States	1.3	16.0	3.9
Other States	2.5	30.1	7.6
Total Indian States	8.3	100.0	25.0

From the foregoing table it will be observed that the Punjab accounts for almost two-fifths of the total area under wheat in British India and over one-fourth of the All-India area, and that the acreages of the Punjab and the United Provinces together (excluding the Indian States within their borders) represent more than two-thirds of the wheat area in British India and one-half of the All-India acreage.

The average area of wheat in the Indian States (1925-26 to 1934-35) was 8.3 million acres and equalled about one-fourth of the total wheat acreage in India. The two largest individual producers are Gwalior and Hyderabad which together grow 2.5 million acres, or more than one-fourth of the total wheat area in the Indian States. Of the Punjab States whose average area aggregates 1.3 million acres two-thirds are contained within Bahawalpur and Patiala, the former having an average area of .5 million and the latter .34 million acres. The number of Central India States submitting returns is five. Their average total wheat area is 2 million acres. The most important areas within this group in order of production are Bhopal, Indore, Bundelkhand, Baghelkhand and Malwa. In 1935-36 these were estimated to have produced over nine-tenths of the total wheat sown in the Central India States.

(b) *Irrigated and unirrigated.*—Irrigated wheat represents on an average 15 per cent. of the total irrigated area in India and forms two-fifths of the total area under wheat in British India. About a half of this lies in the Punjab. The proportion of irrigated wheat is higher in this province than in any other part of India. As will be seen from Appendix III, some 5.2 million acres, or almost three-fifths of the wheat area in the Punjab, is under canal and well irrigation. Wells do not play nearly as important a part in the cultivation of wheat in the Punjab as in the United Provinces but in 1931-32

3.77 million acres of all crops in the Punjab were irrigated by wells as compared with 10.3 million acres by Government and private canals*.

The only other province which compares with the Punjab in the extent of its irrigated wheat area is the United Provinces with an average of about 3.5 million acres. This is rather less than one-half of the local area under wheat. The new Sarda canal system and hydro-electric scheme of well irrigation have been responsible for the recent appreciable increase. In 1931-32 wells accounted for the irrigation of more than 4.7 million acres in all and canals for some 2.8 million acres.

In Sind the main *rabi* crop is wheat and the increase in area is confined entirely to irrigated land. A few years ago the areas of unirrigated and irrigated wheat were of equal importance (Appendix III) but since the Sukkur Barrage commenced functioning in the *rabi* season of 1932-33 the irrigated crop has practically trebled itself. On the other hand, there has been no appreciable change in the unirrigated area, the trend, if anything, being downward. As compared with the last pre-Barrage year (1931-32) when .5 million acres were seeded with wheat the area in 1933-34 rose to over 1.4 million acres which is the maximum so far cultivated. In the succeeding year there was a decline to the neighbourhood of 1.1 million acres owing to unfavourable conditions in some parts of the province. The area in 1935-36† (1.2 million acres) was also below the maximum.

About 90 per cent. of the total irrigated area of wheat in British India in 1934-35 was located in the Punjab, the United Provinces and Sind.

The following table based on Appendix III shows the average, maximum and minimum areas under wheat in the Punjab and the United Provinces with the range of variation during the decade ending 1934-35. The greater variations in the unirrigated area will at once be apparent.

Average, maximum and minimum area under wheat.

(Million acres.)

	Irrigated.				Unirrigated.			
	Average.	Maximum.	Minimum.	Deviation.	Average.	Maximum.	Minimum.	Deviation.
Punjab	5.2	5.6	4.9	0.7	4.3	4.8	3.6	1.2
United Provinces.	3.7	3.9	3.5	0.4	3.8	4.7	3.1	1.6

*Agricultural Statistics, 1931-32.

†Final Forecast, Indian Trade Journal, 20th August 1936.

Generally the area of wheat under irrigation does not greatly change from year to year owing to a regular and assured supply of water. It should be noted, however, that the United Provinces area in 1927-28 has been ignored in the foregoing table as the figures were abnormal owing to copious winter rains. The canal irrigated area in that year fell from 2.5 million acres to 1.9 million acres or by about 21 per cent. and the area irrigated by wells declined by 47.1 per cent.*

Fluctuations in acreage are pronounced in the case of unirrigated areas dependent on rainfall, for the quantities sown depend on the character of the latter half of the monsoon or, in riverine tracts, on floods. Adequate rainfall in August and September is most beneficial. An extreme example may be seen in the irrigated and unirrigated areas sown with wheat in Delhi Province. The minimum occurred in 1929-30 and was 6,202 acres while the maximum area was 38,706 acres in 1924-25. The increase in the latter season was made possible by the severe floods of 1924—and also by the high rainfall in August and September of that year when 10.68 and 12.41 inches fell in the respective months. An increase of 7,645 acres in the area sown with wheat in 1933-34 as compared with the previous season, was due to similar causes, for in addition to a total of 25.08 inches of rain in August and September there were heavy floods during 1933 thereby inundating dry tracts which in the previous seasons were either largely uncultivated or if cultivated were devoted to gram and barley, both being crops which do better than wheat on dry soils. The opposite conditions gave rise to large decreases of acreage in 1934-35 and in 1929-30.

Both irrigated and unirrigated areas have expanded during the past twenty-five years. From the following table which shows the quinquennial average since 1909-10 it is clear that the percentage increase in irrigated area has been almost double that of unirrigated.

Area of irrigated and unirrigated wheat in India.

Quinquennial averages in million acres.

Year.	Irrigated.	Unirrigated.
1909-10—1913-14	10.0	17.6
1914-15—1918-19	11.0	17.1
1919-20—1923-24	11.2	17.1
1924-25—1928-29	11.0	19.4
1929-30—1933-34	12.1	19.6
Percentage increase ..	21.0	11.4

*Season and Crop Report of the United Provinces, 1927-28

(c) *Fluctuations and trends.*—The trend of wheat cultivation during the next few years is difficult to forecast with accuracy. The only area likely to extend its wheat production is Sind. According to the latest information the ultimate area anticipated is just over 2.5 million acres of wheat but as this is not expected for some 30 years after the opening of the Sukkur Barrage the full effect of the increase should not be felt until after 1960. Since however the expansion has been so rapid in the first two years of opening it might be safely assumed that there will be an increase of about .75 million acres in the next five years. So far as Northern India is concerned, an estimate of .25 million acres has been put forward by the Central Board of Irrigation as representing a likely increase in irrigated wheat during the same period while in other parts of India no great change is anticipated. This takes no account of the Haveli project which may lead to an increase in the wheat area in the Punjab after 1940. It seems reasonable to anticipate an increase of about 3 per cent. in the total wheat area during the next five years.

(2) PRODUCTION.

(a) *Method of estimation.*—The estimate of annual production of each crop is based on the formula, area \times standard yield \times seasonal condition factor. In the temporarily settled areas where the basis of assessment for land revenue is revised periodically, e.g., the Punjab, the United Provinces and the Central Provinces, the first factor, namely, area, is known with reasonable accuracy. The second factor, namely, standard yield, is not known with the same degree of accuracy, since it is frequently based on old and doubtful data. The effect of seasonal conditions is the most difficult to gauge as under the present system reliance is placed on the opinions of the local *patwaris* and village *chaukdars* or *thanadars*.

The estimate of standard yield is understood to represent the average outturn on average soil in a year of average character as deduced from the information obtained from experiments made up to the period under review. Revisions are made from time to time in the standard figures and the following table shows the changes, if any, made in certain provinces for each quinquennium since 1911-12

Standard yield.*

(lb. per acre.)

Quinquennium ending—	Punjab.	United Prov- inces.	Central Prov- inces.	Bihar and Orissa.	Sind.†
1911-12	726	1,050	600	984	1,340
1916-17	791	1,050	600	984	1,366
1921-22	856	1,050	600	984	1,032
1926-27	795	1,050	577	984	930
1931-32	791	1,000	548	984	937

*Quinquennial Report on the Average Yield per Acre, 1931-32.

†Irrigated only.

It will be observed that no change was made in the standard yield of the United Provinces for 20 years and of Bihar for 25 years. In the latter province particularly the standard yield appears to be based on information which is quite out of date but experiments on a method of random sampling are at present being carried out.

There is no revenue staff in the districts of the permanently settled provinces of Bengal and Bihar and the difficulties of estimating the correct seasonal factor are much greater than in the temporarily settled areas. An investigation carried out in 1934* indicated the need for all-India statistics and for a new system of recording the area under crops and estimating the yield in the areas under permanent settlement. Outside permanently settled areas it was found that the existing methods appear to answer adequately for assessing land revenues for which purpose they were primarily designed, "but for other purposes they are known to be quite unreliable in most cases"**.

The accuracy of the official estimates of yield are not infrequently regarded as questionable by a large section of the trade. As an example of official scepticism the Punjab Season and Crop Report of 1922-23 may be quoted :—

"The difficulty however, lies in the fact that while we have a very accurate knowledge of the acreage the estimate as to the yield must be accepted with considerable hesitation. The principal exporting firms, for example, get fairly good results by assuming that the wheat outturn is 23 per cent greater than the official estimate."

The Punjab Marketing Report written in 1935-36 referring to the above extract, states that there is no reason to suppose that conditions have very much changed since those lines were written.

The bulk of available evidence seems to indicate that official estimates continuously understate the amount of production. Little allowance seems to have been made for the extensive cultivation of improved varieties and the larger areas under irrigation in recent years. It would appear that the method of computing the official estimates should be subjected to closer scrutiny in some cases. In Delhi, for example, it was found that the annual forecasts of yield were based on the area devoted solely to wheat and that "mixed crop" areas on which wheat is sown along with barley or gram were not taken into consideration. For this reason and also on account of the fact that conversion was being done at the rate of 28 maunds to a ton (instead of 27.2) the official estimates were found to fall consistently short of the actual yields of wheat in the province. The underestimation worked out to an average of over 10 per cent, but in certain years it was over 19 per cent, and 28 per cent.

The improvement of wheat production statistics was discussed at its first meeting in May 1936 by the Wheat Committee appointed

*A Scheme for the Economic Census of India—Bowley and Robertson.

by the Imperial Council of Agricultural Research. It was pointed out that in the case of Bihar, a part of which is under permanent settlement, the crop forecast figures were most unreliable. A 10 per cent. check made there recently on the estimates for sugarcane disclosed a serious understatement which amounted to a 100 per cent. disparity.

The *annawari* system for computing yields is based on the number of annas in the rupee and is the traditional method used in India. The number of annas taken to represent 100 varies in different provinces and ranges from 12 to 16. Ordinarily a 16 anna crop would be regarded as a bumper one, the normal being considered as from 12 to 14 annas.

The system does not appear to be altogether satisfactory and the general tendency is to underestimate yields even if the crop is normal or average. The tendency to underestimate arises from the desire of the agriculturist to put as low a figure as possible on his crops when the local *patwari* or *tapedar** makes his regular enquiries, as it is on production that Government eventually bases the assessment of land revenue. One witness before the Royal Commission on Agriculture in India stated that in his experience the *tapedar* usually puts down 8 annas as a safe figure for his returns.†

Another factor influencing the accuracy of these returns is the efficiency or otherwise of the reporting agencies and the general opinion seems to be that little reliance can be placed on estimates based on primary material collected as at present.

The Wheat Committee after reviewing the present defects in the system resolved to recommend all the provinces to undertake a system of carefully planned randomised crop cutting experiments over a number of years with a view to a complete revision of the existing standard yields. A small sub-committee is being appointed to consider the data available and to report on the methods to be adopted so that some uniformity of procedure be attained as far as practicable.

(b) *Yield per acre*.—Variations in yield occur from year to year in every district owing to seasonal factors. Agricultural practice also affects the yield. For example, in the Central Provinces, in those parts where wheat is sown as a second crop after paddy, the yield is considerably less than when sown as a main crop.

The normal yield per acre primarily depends upon whether the crop is irrigated or unirrigated. The effect of irrigation on wheat yields is seen from the following table giving the latest published data‡ relating to the standard yields under irrigated and unirrigated conditions in certain provinces.

*Village accountants—The former is the term used in the Punjab and the United Provinces, the latter in Sind.

†G. S. Henderson—Minutes of Evidence of the Royal Commission on Agriculture, Vol. I, Part 2.

‡Quinquennial Report on the Average Yield per Acre, 1931-32.

Standard yield for irrigated and unirrigated areas.
(lb. per acre.)

	Irrigated.	Unirrigated.
Punjab	967	572
United Provinces	1,200	800
Sind	937	734
Bombay	1,250	510

It may be observed that in Bihar and Orissa where the total irrigated area in 1934-35 was a little over 300,000 acres no separate computation is made in respect of irrigated land ; similarly, in the Central Provinces where irrigated wheat represents only about 1.3 per cent of the crop.

The standard yields of irrigated and unirrigated wheat vary from one area to another. For example, in the Hissar district in the south-east Punjab which is noted for the capricious nature of its annual rainfall, the standard outturn of irrigated wheat is reckoned at 1,000 lbs. per acre and unirrigated at only 400 lbs. In the rich Jullundur Doaba tracts including the Hoshiarpur and Ludhiana districts, the normal yields of unirrigated land are relatively high and range from 680 lbs. to 720 lbs. per acre as against 1,000 lbs. for irrigated wheat. In the United Provinces where the rainfall is heavier the standard normal yields on both irrigated and unirrigated lands are higher than in the Punjab, but the ratio which they bear to one another is much the same.

In spite of the higher standard yield per acre on irrigated land there does not appear to be any direct relation between the average yields and the relative proportion of irrigated and unirrigated land in different provinces. The following table shows the average yield of wheat in certain provinces and States based on the estimated average annual outturns of the period 1925-26 to 1934-35.

Average yield of wheat.
(lb. per acre.)

Punjab	738	Sind	593
United Provinces	786	Hyderabad	231
Central Provinces	444	Gwalior	458
Bihar and Orissa	882	Central India	382
Bombay	447		

The estimated outturns are consistently highest in Bihar and lowest in Hyderabad, where it is predominantly a "dry" crop. Although the proportion of irrigated wheat in Bihar is lower than

in the Punjab or the United Provinces, the high yields reported by the former province may possibly be due to the effect of the frequent floods to which Bihar is periodically subjected and the consequent renewal of rich deposits of silt.

It might be assumed that owing to the regularity of the water supply in irrigated areas and the dependence of unirrigated land on the vagaries of the monsoon there would be a much greater degree of stability in the average yield per acre from one year to another on the irrigated land, but the figures available in the Punjab, which is the only province maintaining full details for the two types of land, seem to indicate that the extremes of variations are almost as great on irrigated as on unirrigated land. The following table shows the average yields on both types of lands in the Punjab during the years 1924-25 to 1934-35.

*Average yield on both types of land in the Punjab.**

(lb. per acre.)

— — —	Average.	Minimum.	Maximum.
Irrigated	913	694	1,064
Unirrigated	451	383	578

The variations in yield on the irrigated land range from more than 16 per cent. above to over 24 per cent. below the average and on unirrigated land the extremes were 28 per cent. above and 15 per cent. below. It may be observed, however, that the low figure for irrigated land is mainly due to the very bad year of 1927-28 when the crop suffered severely from rust and smut and also from dust storms and hail storms, which apparently did more local damage in the irrigated canal colonies than in the unirrigated districts so that although the average on the irrigated land that year was very much reduced that on unirrigated land was little affected.

The estimated annual average yields per acre of wheat throughout the whole of India during the past decade have been as follows :—

Average annual yield in India.†

(lb. per acre.)

— — —	Average.	— — —	Average.
1925-26	639	1930-31	648
1926-27	642	1931-32	598
1927-28	542	1932-33	642
1928-29	602	1933-34	581
1929-30	741	1934-35	632

*Season and Crop Report of the Punjab.

†Estimates of Area and Yield of Principal Crops in India.

Compared with the five-year pre-war average outturn of 724 lb. (1910-14) the average yield in more recent years appears to have decreased, but whether this reduction is real or only apparent depends mainly on the accuracy of the official estimates as previously referred to. For comparative purposes the following statement gives the estimated average yields of wheat per acre in the main producing countries.

Approximate yields in certain countries.

(lb. per acre.)

					Average 1924-1933.	Average 1909-1913.
United States	..	.	..	..	846	852
Canada	..	.	..	..	972	1,188
Australia	.	..	..	..	714	708
Argentina	.	..	..	..	780	594
Europe	.	.	..	..	1,146	1,110
Russia	.	..	..	..	636	612
India	..	..	..	..	636	724

Yields of durum wheat.—The average yield in the Central Provinces is reported to be in the neighbourhood of 400 lbs. per acre and may be taken as fairly typical of the *durum* producing tracts in Central India and Bombay. In the Deccan, however, where yields are rather lower, an average of 300 lbs. per acre would probably not be far off the mark.

(c) *Total quantity.*—A detailed statement of outturns in the main producing areas is given in Appendix I. The share of each province is illustrated in diagram on page 2, and the following table summarises the position of the more important areas.

Average production—1925-26 to 1934-35.

					Million tons.	Percentage of total production in British India.	Percentage of All-India production.
British India—							
Punjab	..	..	..	..	2.9	38.6	31.2
United Provinces	..	..	..	..	2.6	34.8	28.0
Central Provinces	..	..	..	..	.7	9.2	7.5
Bombay	..	..	..	..	.3	4.2	3.2
Sind	..	..	..	..	.2	2.6	2.1
Others	..	..	..	..	.8	10.6	8.6
Total British provinces					7.5	100.0	80.6

—				Million tons.	Percentage to total production in Indian States.	Percentage of All-India production.
Indian States—						
Central India States	..	..		·3	16·7	3·2
Gwalior	..	..	..	·3	16·7	3·2
Hyderabad	..	..	..	·1	5·6	1·2
Punjab States	..	..		·4	22·2	4·3
Others	..	..	..	·7	38·8	7·5
Total Indian States	..	..		1·8 1·7 1·9	100·0	19·4

As in the case of the area under wheat the estimated production has not varied by more than 10 per cent. either way save in one exceptional year, 1929-30, when in spite of a less than average acreage, the crop, favoured by ideal weather conditions, exceeded the average by almost 20 per cent.

It will be observed that the average production of wheat in the Punjab and the United Provinces accounts for about three-fifths of the Indian crop and represents a greater proportion of the total production than of acreage. This appears to be due to the higher yields per acre obtained by irrigation. The trend of production in the United Provinces is, however, apparently not keeping pace with the increase in acreage.

(3) QUANTITY RETAINED BY CULTIVATORS AND IN THE VILLAGES.

During the course of this survey it was found very difficult to determine with any degree of precision the amount actually retained in the villages of any district or province. The various degrees of indebtedness, for example, caused most of the cultivators to hand over varying proportions of their grain to creditors soon after harvest. Enquiries in the Delhi area show that about one-third of those who were questioned parted with practically all their wheat directly to the village *baniya* in payment of debts incurred in the previous year, and 40 per cent. had no surplus at all to sell. In some cases they even had to obtain wheat from the village *baniya* either on credit or by selling other products such as gram or barley.

Other elements added to the difficulty of gauging how much of the crop is retained in the village. In some districts the custom of payment in kind is prevalent for harvest labour and other services. In the United Provinces the amount paid out in kind on account of

labour amounts to about 10 per cent. of which half is on account of harvesting. It is also the practice to pay the village iron-smith, carpenter, sweeper, etc., in kind and apart from that, in many districts cultivators are accustomed to barter wheat with vendors of vegetables, salt, spices, wearing apparel, etc.

The size of the holding also has a great deal to do with the percentage retained. The Provincial Marketing Officer, United Provinces, reports certain results of an examination affecting about 80 different holdings. The amount retained on holdings over 15 acres was apparently only 25 per cent. On holdings between 5 and 15 acres the proportion was about 50 per cent., but on smaller holdings the percentage was over 60. Similar enquiries in the Punjab show that in Lyallpur where about 90 per cent. of the holdings are over 10 acres the quantity kept for local consumption was less than 35 per cent., but in Attock where about 18 per cent. of the holdings are under an acre the quantity retained was almost 68 per cent., and in Ferozepur where the number of small holdings was larger the percentage retained ran to a much higher figure.

Another factor which influences the amount of wheat retained is the comparative value of the local production of other food grains such as gram, barley, maize and rice. The effect of this factor is particularly evident in Bihar where paddy is an important crop and the quantities of barley and gram are each as great as the total amount of wheat. It is not surprising therefore to find that the amount of wheat sold is very high and the percentage retained is relatively low.

Owing to the operation of all these factors the percentage retained varies considerably from district to district within a province. For example, an analysis of conditions in the United Provinces shows that in the western districts the proportion retained is only about 40 per cent. ; in the central districts this rose to over 50 per cent. , and in the eastern districts to a very much higher figure.

As a result of all these variations, owing to the interaction of different factors, the following estimates must be regarded as a reasonably approximate guess for practical purposes, of the amount retained in the cultivators' village for all purposes including seed. The balance may be regarded as the amount available for sale.

It seems that the highest proportion of the crop is retained in the villages of the Punjab and Jammu where the figure is about 60 per cent. In the dense wheat growing area in the north of the Central Provinces about 70 per cent. of the crop is ordinarily retained, more than half being for domestic consumption and the remainder for servants and hired labour. In the central parts of the province where less wheat is grown only about 40 per cent. is retained. Taking the province as a whole somewhere between 55 and 60 per cent. of the wheat crop remains in the villages. In Patiala mainly owing to maize, gram and barley being used to a fairly large extent in the diet, the percentage of wheat retained is about 50 and in the United Provinces, although it varies considerably from east to west, as already referred to, somewhere between 50 and 55 per cent. of the

total crop is retained. In Bihar, on account of the various factors mentioned above, the amount retained is a little more than one-third. The figure is about the same in Sind owing to the fact that wheat there is regarded as an important cash crop. In Bengal retention is about 50 per cent. In Assam wheat is grown only in small patches and is hardly sufficient to meet the producers' requirements so that little or none is sold. In Madras where the crop is also relatively unimportant, about one-third of it is retained in the village and a similar proportion in Kashmir. In Rajputana and in Gwalior less than 25 per cent. is retained and in the Central India States generally the figures are higher. In Bhopal, for example, 50 per cent. is retained, in Narsingarh about two-thirds and in Rajgarh three-fourths. In Baroda and Hyderabad where wheat does not form the staple food of the cultivators, it becomes a cash crop of some importance and only about 10 per cent. is retained. The local cultivators appear to sell off practically the whole of their crop, and when it becomes necessary to obtain wheat for seed or domestic use they purchase or borrow from the *banjyas*.

Making allowance for all these varying percentages and also for the amount of wheat grown in the different districts, it would appear that approximately 4.25 million tons or forty-five per cent. of the total crop grown in India is retained in the cultivators' village. Of this, about 1.25 million tons represents seed requirements, the balance being for domestic consumption, barter, payment in kind for hired labour, etc.

It may be observed that practically none of the wheat retained is used for stock feed except in Sind where a few of the bigger zemindars feed wheat to their riding horses during the period June to August, when no other feed grain is readily available. In the Punjab and the United Provinces also wheat is occasionally given to a newly calved cow or buffalo and in some of the larger cities, e.g., Calcutta, Bombay and Hyderabad (Deccan), a certain amount of wheat is used as poultry food. Apart from these few instances wheat is not ordinarily fed to livestock and the amount thus used may be disregarded for all practical purposes.

(4) PERIODICITY.

The seasons of sowing and harvesting vary considerably. In normal conditions in the north and north-west where the summer is very hot and the winter fairly cold, the bulk of the crop is generally sown by the end of November but late sowings may occasionally be undertaken well into December. Wheat grown in the warmer and more humid Gangetic plains of the United Provinces and Bihar is ordinarily sown a fortnight to a month earlier than in the Punjab. Towards the east sowings are progressively earlier. In Central India seedling is usually over by the end of October or early November, while in the Deccan and parts of the Bombay Presidency the crop is sown between September and the middle of October. By the beginning of December the entire wheat crop has been seeded.

Wheat takes 3 to 6 months to ripen according to the location and variety. In the south the growing period is shorter than in the north. In the Carnatic in the south of the Bombay Presidency and

in the Deccan generally, harvesting may begin at the end of December, and is at its height in the middle of February. Further north, in the Central Provinces and Central India, harvesting is normally in full swing by the middle of March. In east United Provinces operations are well under way by the end of March. In the west of the United Provinces, where the great bulk of the local crop is grown, in Delhi and in the eastern tracts of the Punjab, harvesting is normally at its height towards the end of April but may commence towards the end of March and last until the middle of May. In the remainder of the Punjab and northern Sind harvesting is generally a fortnight later, and in certain parts—for example, the hills—the crop may be harvested as late as June. For the great bulk of the Indian crop the height of the harvesting season falls in April and May.

Marketing commences with the harvest and as a rule the small cultivator is the first to dispose of his produce, while the larger farmers are still busy over their harvest. In general, the bulk of the cultivators' surplus finds its way to the market during April, May and June, and especially in the two latter months. The average monthly arrivals as indicated by municipal, railway and customs records, at a number of large markets in India are shown in Appendix IV. Conditions in the major producing areas however vary so greatly that they are best described individually.

(a) *Punjab*.—At the two most important Canal Colony markets in the Punjab, *viz.*, Lyallpur and Gojra, the bulk of the season's arrivals occur in the months April, May and June and, on the average of 5 years, represent over 53 and 55 per cent. of the respective totals. During the remainder of the year incomings are fairly well spread out but receipts are generally lowest in January and February. Records of the sales of four commission shops, in different districts* administered by the Department of Agriculture, indicate that more than two-thirds of their annual turnover takes place between April and June.

(b) *Sind*.—In Sind the crop usually begins to move after the middle of April and continues until the middle of July when there is a slackening off during the rains. After the monsoon the rate of movement continues slow, but there is a tendency to increase slightly between October and December. During February and March the flow of supplies drops to a minimum. With the exception of Karachi, for which authentic figures are available regarding rail imports, no other markets in Sind have any arrangement for recording this data. As an indication of the movement, however, the volume of wheat carried by rail from four of the chief markets† has been ascertained. This shows that well over three-fourths of the surplus moves out from the producing areas between the end of April or beginning of May and the middle of July.

(c) *United Provinces*.—The average receipts for the past three years at eight important markets‡ in the United Provinces show that

*Pindi, Bahaudin, Arifwala, Jaranwala, Gojra.

†Nawabshah, Dadu, Shahdadkot, Mirpurkhas.

‡Meerut, Aligarh, Najibabad, Bareilly, Lucknow, Fyzabad, Benares, Jhansi.

the immediate post-harvest months of April, May and June are the busiest months of the season, for about 40 per cent. of the total annual receipts are registered in that quarter. The proportion in the four months including July is nearly half the annual total. August and September show the lowest activity.

(d) *Delhi*.—In Delhi Province the period April to June shows consistently heavier movements of wheat than any other three consecutive months, excepting in 1931 when imports during December were abnormally high for that period of the year. The volume of road traffic to urban Delhi in 1933 and 1934 has been calculated by deducting rail imports from the total quantity of wheat known to have been received within municipal limits. The difference which may be taken as an index of the movement of locally grown wheat from the field to the market shows that in 1933 more than a half of the total receipts by road occurred during the four months from March to June, and in 1934 road traffic for the same period accounted for as much as two-thirds of the whole year's receipts.

(e) *Bihar and Orissa*.—In Bihar markets arrivals are highest in May, and in the four months April to July over 55 per cent. of the supplies are marketed. During the rains owing to the difficulties of rural transport the rate of marketing is slow but rises again during November and December.

(f) *Central Provinces*.—In the Central Provinces about 75 per cent. of the surplus is marketed by the end of June. At Rajnandgaon Gunj over 57 per cent. of the average annual arrivals of five years (1931–34) was received between March and May.

(g) *Bombay Presidency*.—In the southern districts of Bombay Presidency the largest market arrivals are between February and May. This is about two months earlier than in the north where the flow of supplies is greatest from April to June. The proportion of the crop handled during the three or four post-harvest months is high in all parts of the province. It was ascertained from the trade at six important centres* that from one half to four-fifths of the total annual arrivals into those markets were disposed of during the three or four months immediately following the harvest. It was also observed that in the south of the province the proportion handled during these months, although large, was rather less than in the north.

(h) *General*.—All the evidence indicates that between 50 and 60 per cent. of the total supply is marketed soon after harvest, from the beginning of April until the middle of July before the monsoon interferes with the free movement of produce in the interior.

The two branches of the monsoon normally break in the south of Bengal and on the Malabar Coast by about the middle of June. Rainy weather gradually spreads inland and northwards reaching the Punjab usually about the first half of July. By the end of September the rainfall over the greater part of the wheat growing area has practically ceased. Throughout the interior during these

* Ahmedabad, Nasik, Ahmednagar, Lasalgaon, Bijapur, Dharwar.

three months the weather disorganises the free movement of produce. Wheat, if exposed to rain during transit, deteriorates rapidly. This danger is greatly minimised when goods are consigned by rail, but owing to a general lack of suitable protective material, cultivators and others moving wheat by bullock cart run grave risks of damaging their goods. During the monsoon the inadequacy of rural communications also restricts the free movement of wheat. Metalled roads are relatively few and the great majority of village roads are merely tracks winding through the fields. These resemble quagmires in the rains and are often impassable to bullock carts and more so to motor lorries. On that account so long as the weather is inclement it is difficult for supplies to reach the majority of upcountry assembling markets from the villages. Country whole-sale markets in all the wheat areas are rendered almost inactive, although the retail trade continues at all seasons. Notices such as "market closed owing to rain" or "no quotation owing to rain" appear from time to time in the quotations of the daily press. In the markets where prices are registered by local trade associations or by a co-operative society, such as the Okara Zamindars' Co-operative Society in the Punjab, these words frequently appear in the records during the rainy season, sometimes on three or four consecutive days.

The number of carts bringing wheat to Gwalior market, for example, may be taken as an index of the effect of monsoon conditions. The following table shows that a total of 5,295 and 5,973 carts each carrying between 16 and 20 maunds of wheat entered Gwalior in 1933 and 1934 respectively. Each year about two-thirds of this traffic occurred between April and June, but the significance of the data lies in the decline in imports from July to October. The number of carts arriving between July and September 1933 was only 3 per cent. of the total, and in 1934 less than 4 per cent.

Arrivals of wheat in Gwalior market.

(In carts of 16—20 maunds each.)

Month.	1933.	1934.	Month.	1933.	1934.
January	291	467	July	47	140
February	202	562	August	39	35
March	205	191	September ..	53	40
April	959	905	October	89	69
May	1,758	2,197	November ..	506	225
June	599	829	December ..	547	313
Annual total ..	..	..	..	5,295	5,973

Traffic by rail, river and sea does not contract to the same degree as road traffic in the monsoon. For example, during the wettest months of the year the volume of shipments of wheat by sea from Karachi to Bombay is unaffected and forms a very high proportion of the annual movement as will be seen from the following table :—

Shipments of wheat from Karachi to Bombay.

(Tons.)

—	1932-33.	1933-34.	1934-35.	1935-36.*
July-September ..	22,646	23,611	28,758	12,945
Remainder of year ..	30,561	45,450	37,421	7,878
Total	53,207	69,061	66,179	20,823

*April to December only.

Receipts of wheat by rail into Karachi from Sind and the Punjab are also very considerable throughout the monsoon period. According to a five years' average of monthly arrivals (Appendix IV) the quantity imported between July and September is nearly two-fifths of the total annual imports. Other instances of rail and steamer traffic being relatively unaffected by the monsoon are given in the same Appendix. In Bihar although precise figures are not available river traffic, chiefly by country boats, is reported as being at its heaviest during the monsoon months of July and August.

In the post-monsoon period the cultivator gets busy in October and November with the preparation of the land for and the sowing of the *rabi* or spring crops, e.g., wheat, barley, gram, etc., and in the harvesting of the *kharif* or autumn crops such as maize. Consequently the movement of such wheat as is left in the village or on the holding after the monsoon is dependent on the size and condition of the *kharif* crop and the prospects of the *rabi* crop.

Later on during the cold season there is a distinct tendency for the demand for wheat products to increase and most of the large mills are consequently busier during the autumn and early winter than at other periods of the year (Appendix V). Exports of wheat to consuming centres from the wholesale markets which commonly hold large stock tend to rise after September and continue at a fairly high level throughout the early winter months. Much of this movement is, however, by rail between one wholesale market and another, for the bulk of the crop has already left the farm or village in the post-harvest months before the monsoon. At Hapur,

for example, a typical storing centre in the Western United Provinces, an examination of monthly rail exports for three years (1932-33|1934-35) indicates that the period May to August has practically no export worthy of note. In September there is a sudden jump to about 1,000 tons. In October this figure is almost doubled and during the ensuing five months from November to March exports rise steadily to a peak in February in which month the quantities exported during 1932-33, 1933-34, 1934-35 were roughly 6,500, 10,300, and 6,100 tons respectively. In March despatches begin to tail off until they drop back in April almost to the previous September figures.

(5) QUALITIES AND TYPES.

Between 1906 and 1909 some 37 separate botanical varieties of wheat were identified by the Howards of which ten belonged to the sub-species *Triticum durum*, two to *Triticum turgidum*, one to *Triticum dicoccum*, six to *Triticum compactum* and the remaining eighteen to *Triticum vulgare*, the last named species embracing the greater portion of the wheats grown in India. An examination (to which more detailed reference will be made later) of nearly 1,400 commercial samples drawn from all parts of the country in 1935 and 1936 shows that no great change has taken place in the geographical distribution of wheats in India during the intervening years, except that in Northern India the cultivation of red wheat has declined in favour of the white variety, while the area in Madras has diminished considerably. The two main kinds of wheat grown in India are those belonging to the *vulgare* and *durum* sub-species. A third type (*Triticum dicoccum*) referred to as Spelt in some recent publications, is found in the Bombay Presidency and to a very small extent in Madras and Mysore. Dwarf wheats (*Triticum compactum*) were formerly cultivated on a fairly large scale in the south and south-west Punjab but the production of this species appears to have declined and is at all events of no special commercial importance.

✓ (a) *Geographical distribution*.—(i) *Triticum vulgare*.—These are the common wheats used in large quantities by the milling industry for the manufacture of flour (*maida*) and *ata*. They are grown extensively under irrigated and unirrigated conditions in the important alluvial tracts which extend over the greater portion of Sind, the Punjab, Rajputana, the United Provinces, Bihar and Bengal. Both awned and awnless types are grown, the former being preferred in many areas as they are less liable to attack by birds, wild pig, deer, etc. The grains are usually of medium size and may be white or red while the kernel structure ranges from soft to hard. The soft white types are often bright straw coloured and are opaque. The endosperm or floury portion of the grain is friable and starchy in appearance. The hard types range from a greyish white to dark amber in colour and are generally translucent. When cut the fracture is smooth and glass-like.

While the species *Triticum vulgare* greatly predominates throughout the main wheat producing areas in Northern India

which extend from Sind in the west to Bengal in the east, it is also extensively cultivated in the dense wheat zone in the north of the Central Provinces and is estimated to form about two-thirds of the entire wheat crop of that province.

White wheats.—Although soft* and hard varieties grow in adjacent tracts and sometimes even in adjoining fields there is a fairly distinct localisation of types. Hard or semi-hard white wheats of the *vulgare* species for example are found mainly in the Canal Colony areas in the Central Punjab and in North Sind and consist largely of improved varieties, such as Punjab 8-A, which have been developed by isolation and selection from the *desi* or local types of wheats commonly cultivated in the province. As about 36 per cent. of the total wheat area in the Punjab now consists of improved varieties, the production, having regard to the increased yields given by the improved varieties, is considered to be not less than 40 per cent. of the total outturn of the province.

Soft and semi-hard white wheats are generally found in the central and eastern districts, but environmental influences and seasonal factors appear to play a large part in determining the quality and structure of the grain. For instance, under heavily irrigated conditions a wheat, such as Punjab 8-A, which would normally be classed as hard, may change its character by developing a soft or uneven texture. *Durum* wheats are not grown in the Punjab to any appreciable extent but a few samples drawn in the Canal Colonies area and in the east and south east Punjab were found to contain from 1 per cent. to 9.2 per cent. of *durum*.

In recent years hard or semi-hard wheats have spread in the western districts of the United Provinces but Muzaffarnagar *desi*—a soft white high-yielding wheat of long standing cultivation—is still extensively grown. Chandausi wheat is a semi-hard variety well-known to the trade not only in the United Provinces but also in Calcutta and other large consuming centres in the east of the United Provinces and in Bihar. Elsewhere in this province the white wheats are in the main soft in character but there are tracts in the central parts of the United Provinces around Cawnpore, Lucknow and Barabanki as well as areas in the south, e.g., in the Banda, Hamirpur, Jhansi and Jalaun districts, where a little hard white wheat is produced.

Rather less than half of the Bihar crop is composed of white wheat of which by far the greater proportion is soft. The predominant improved white variety at present is a semi-hard wheat—Pusa 52—the most useful wheat so far tried in Bihar.

*It should be noted that the term "soft" is used here in a relative sense. The soft wheats of the United Provinces and the Central Provinces are mellow and more starchy than their Punjab counterparts. The method of classifying wheats as hard, semi-hard, soft, etc., is of necessity an unsatisfactory one as many of the varieties described here are intermediate in character. Some may also be variable in structure, e.g., hard wheats may sometimes have soft starchy portions.

The hard white wheat grown in this province may usually be identified as Pusa 4. *Desi* or local types are, however, cultivated to a far greater extent than improved varieties.

In the Central Provinces soft white wheat is the chief variety grown in the upper Nerbudda Valley and in the Saugor, Damoh, Jubbulpore and Seoni districts and about two-thirds of the entire production of this province may be so classed.

In Rajputana the area occupied by soft white wheat appears to form not more than 10 or 12 per cent. of the local acreage. In the States of Dungarpur and Datia where the proportion of white wheat is greater than in any other of the Rajputana States, the percentages are 20 and 30 only. In Central India the proportion of white wheat is rather higher and in the States of Bhopal, Khilchipur and Sailana white wheat forms 50, 60 and 50 per cent. of the respective local wheat crops. The production of soft white wheat is very small in Bombay Presidency where it occurs mainly as a garden crop in a few of the central districts and in the Carnatic, notably in Bijapur. The majority of the wheat grown in the Presidency is of the *durum* type and will be referred to later. In Hyderabad (Deccan) the production of soft white wheat formed only about 14 per cent. of the total crop in 1935.

Improved wheats.—As all the improved varieties may be classed as white wheats reference to the development of the production of these wheats may appropriately be made in this section. The total area at present under improved wheats in India is about 6.5 million acres representing 19 per cent. of the total wheat acreage. The great majority of these wheats are hard or semi-hard and belong to the species *vulgare*. The most important varieties now under cultivation are Punjab 8-A, 9-D, Pusa 4 and Pusa 12, but soft wheats such as Pusa 52 and Pusa 54 are also of considerable importance in Bihar and the United Provinces. The first named was obtained by isolation from indigenous varieties, while Pusa 4 and Pusa 12 are selections from similar local growths. Pusa 52 was evolved by hybridisation between Punjab 9 and Pusa 6. Mention should also be made of two new types which have recently been evolved in the Punjab and are now being issued for general distribution. These are C-518 and C-591 both excellent hard white or amber wheats noted locally for the fine "strong" quality of their *ata* and selling in the Punjab at 5 to 8 per cent. more than the ordinary *dara* or fair average qualities. The position in the major provinces is briefly as follows :—

Punjab.—The greatest concentrated area in India under one single type of wheat is probably that devoted to Punjab 8-A. Much of the acreage under this type is to be found in the Canal Colonies of the Punjab*. It may be observed that this province contained a little over half the total area (6,489,484 acres) in India sown with improved varieties in 1934-35. Punjab 11 is a soft white wheat formerly grown in the Punjab on a large scale but it has been practically ousted by the better known 8-A owing to the latter's higher

*Lyallpur, Shahpur, Sheikhpura, Jhang, Multan, and Montgomery districts.

yield and better quality and is now of little importance as will be seen from the following table.

Area under improved varieties in the Punjab.

(Thousand acres).

Year.	Types.		
	No. 8-A.	No. 11.	Others.
1925-26	834	625	10
1926-27	917	510	12
1927-28	1,276	467	116
1928-29	1,752	252	96
1929-30	1,858	135	524
1930-31	2,292	76	80
1931-32	2,549	59	164
1932-33* .. .. .	..	..	..
1933-34	2,805	41	89
1934-35	3,042	35	154

In *Sind*, Punjab 8-A is also being grown and it was at one time anticipated that when the Sukkur Barrage area was fully developed some 100,000 acres would eventually be put under this type of wheat. Owing, however, to its susceptibility to rust the spread of Punjab 8-A has not been an unqualified success in *Sind* and its subsequent expansion may eventually falsify original expectations. Pusa 114 selected from a natural cross in Federation wheat is a high grade wheat of good milling quality and has been found suitable for cultivation in *Sind* as it is rust resistant and yields better than Punjab 8-A in seasons when rust attack is severe.

Detailed figures of acreages under individual improved varieties are not available for the *United Provinces*. The area is estimated, however, to have increased from 1 million acres in 1926-27 to 2.45 million acres in 1934-35 which represents about one-third of the total area under wheat in that province. Pusa 4 and 12 (selected from indigenous varieties) are the main improved wheats of this province but Pusa 52 is spreading in the eastern districts. The cultivation of Punjab 8-A has also extended in the western districts of the *United Provinces* largely as a result of importations by local stock holders in the large markets. Cawnpore 13 and Muzaffarnagar hard and soft types respectively continue to be popular. New varieties such as Punjab 518 and Pusa 111 and Pusa 112 also give promise of replacing some of the older types.

In *Bihar and Orissa* the predominant improved variety is Pusa 52 a soft white wheat, while Pusa 4 and 12, both hard wheats, rank

*Total area was 2,515,300 acres.

second and third. The area sown with improved seed in 1934-35 was 54,342 acres as compared with 54,484 acres in 1933-34 and represents rather less than 5 per cent. of the total wheat acreage.

In *Central Provinces* the area under improved wheat has expanded from 135,000 acres in 1926-27 to 572,000 acres in 1934-35. Some of the more important improved varieties are hard and semi-hard white wheats of the *vulgare* species known under the type numbers A112, A115 and A090. Although the rate of expansion has been relatively greater than in the Punjab and the United Provinces, only about 16 per cent. of the total area under wheat is represented by improved varieties whereas in the Punjab and the United Provinces the proportion is 36 and 32 per cent respectively.

The total area of improved wheats—mostly *durums*—in the *Bombay Presidency* was 42,151 acres in 1934-35, an increase of 14 per cent. compared with the previous year.

In the *North West Frontier Province* 25,943 acres out of 998,000 were under improved strains—mostly Pusa 4. Compared with the previous year when only 1,523 acres were sown the expansion is noteworthy. Punjab 8-A, Pusa 111 and Punjab C-518 are being tried out in this province. Pusa 4 is also being tried out in the Deccan.

Red wheats.—Although earlier surveys have shown that red wheat was cultivated on a large scale in many parts of the Punjab and the United Provinces it would appear that the area at present devoted to red wheat has declined considerably except in Rajputana, Hyderabad (Deccan), the Bombay Presidency and possibly to a lesser extent in the east of the United Provinces and in Bihar.

In former years red wheat predominated in the eastern Punjab and particularly in the Ludhiana, Jullundur and Ferozepur districts, and it is interesting to observe that the two “futures” trading associations in Ludhiana are the only ones in the whole country which have a contract solely for red wheat—in addition to the white wheat contract. While the red wheat contract still functions the amount of forward trading in red wheat “options” has declined considerably. Soft red wheat still occurs on a small scale in many of the districts in the north eastern and eastern Punjab but hard reds are more commonly found in the Rawalpindi division in the north of the province. In northern India it is believed that red wheat does better than white on poor soil and this probably accounts for its being frequently sown as a mixture with gram or barley.

Red wheat is grown in the United Provinces, particularly in the eastern districts adjoining Bihar, where it forms more than half of the total wheat crop, much of the red wheat area being south of the Ganges.

All the common red wheats grown in Rajputana appear to be soft, and are cultivated to a marked degree in the north and north eastern States of Alwar, Dholpur and Karauli where between 90 and 100 per cent. of the wheat grown locally is red. The propor-

tion falls, however, towards the south and south east of Rajputana ; for example, in Udaipur only about 25 per cent. of the crop consists of red wheat, in Datia 50 per cent., in Banswara 65 per cent. and in Dungarpur State 40 per cent.

In *Central India* the production of red wheat, occurs only in Indore where 20 per cent. of the total production is estimated to consist of soft red types. A good deal of soft grained mixtures of red and white wheats are grown in Bhopal, Narsingarh and Rajgarh. It should however be noticed that red wheat is grown in most of the wheat tracts interspersed with white in varying proportions. In those areas in which red wheat is grown, marketed and consumed, e.g., in Rajputana, or Bihar, the locally grown white wheats contain a relatively higher proportion of red grain admixture.

(ii) *Triticum dicoccum*.—*Emmer* wheat is found only in the south of India and mainly in the Bombay Presidency. Although a number of recent publications refer to this wheat as “ Spelt ” the original classification given by the Howards has been adopted in this report. The largest proportion of *emmer* is grown as an irrigated crop in Bombay, and its cultivation is also practised, to a small extent only, in Hyderabad (Deccan), Mysore and Madras. *Emmer* was formerly grown on a small scale in the Central Provinces* and appears to have been partially replaced by *Jalalia*, a *durum* type. Its cultivation still persists however in the Khandwa district and it is used by the cultivators’ families to make vermicelli and semolina and is not marketed. *Emmer* is very easily distinguishable from the other types of wheat already described. The grain is red, hard and flinty, slender and pointed and is enclosed in the glumes when threshed.

(iii) *Triticum compactum*.—Dwarf wheats appear only to be grown in the south west Punjab, in the Multan division. The grains are usually white, small and rounded. This wheat is mostly consumed locally and is not of any commercial importance.

✓(iv) *Triticum durum*.—These are also known as macaroni wheats. The ears are long and generally bearded and the grain itself is long, pointed, hard and flinty. *Durum* wheat has a high gluten content and is greatly prized for the making of semolina (*suji*) and for the preparation of the Indian counterpart of vermicelli known in the vernacular as *sewayan*†. For these reasons it fetches a premium of anything up to 20 or 25 per cent. over the *vulgare* types. (Chapter III).

Durum wheat is usually white or amber coloured but the red variety is of considerable importance in the Hoshangabad, Nagpur and Sailana zones in the Central Provinces and rather less so in the extreme south of the United Provinces (Banda, Hamirpur and Jhansi). It is also grown in the Nasik and Khandesh districts of the Bombay Presidency and in parts of Gujerat. Red *durum* is

*Howard and Howard—Wheat in India, (1909).

†Spelt also “ *stawaiyan* ” or “ *sewain* ”.

DURUM



KHAI (SEMI) - ROMA



MAH (CENTO) INDIA



MAH (CENTO) INDIA



MAH (CENTO) INDIA



MAH (CENTO) INDIA



MAH (CENTO) INDIA

VULGARE



WHITE (CENTO) INDIA



WHITE (CENTO) INDIA

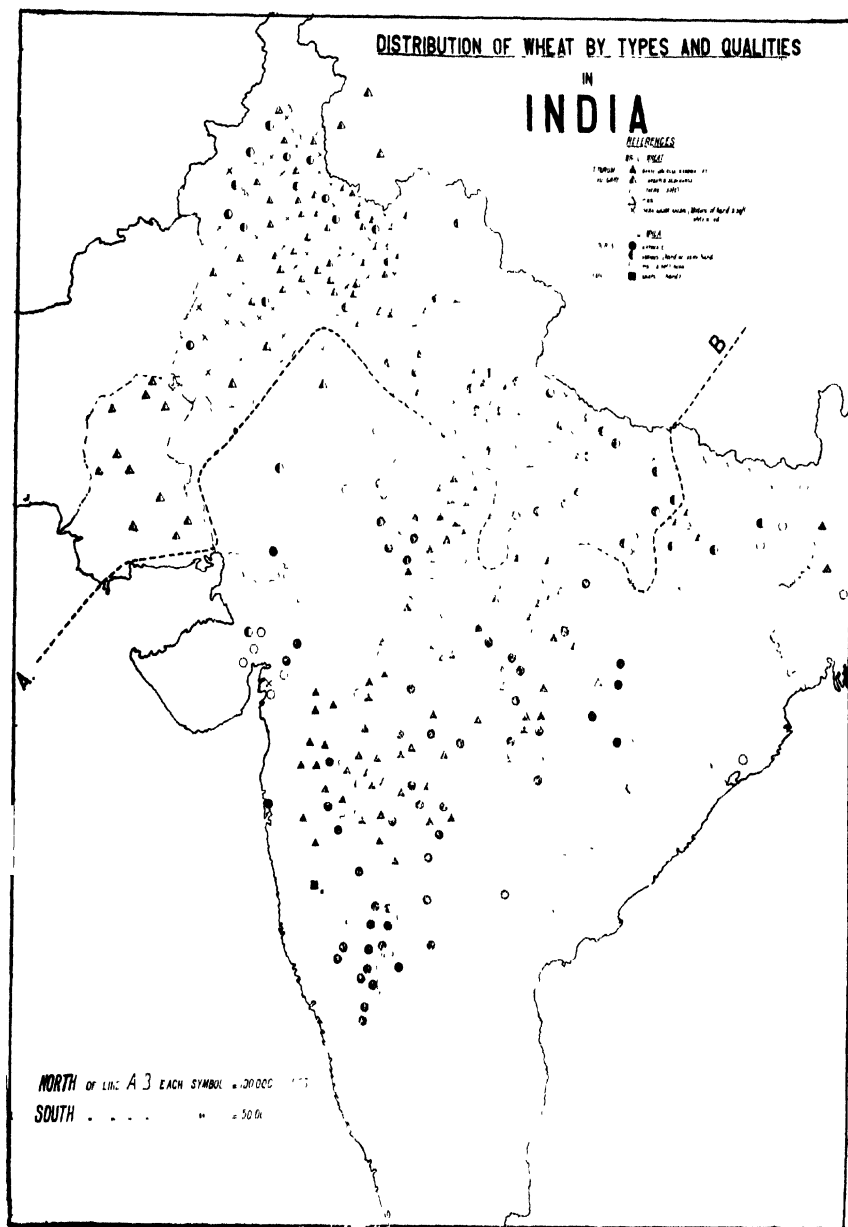


WHITE (CENTO) INDIA



WHITE (CENTO) INDIA

THE CHIEF COMMERCIAL VARIETIES OF INDIAN WHEATS.



cultivated extensively in the east central and south-eastern parts of Rajputana and forms between 80 and 90 per cent. of the production of the States of Jhalawar, Tonk and Paraggarh. In the neighbouring States of Banswara, Dungarpur, Udaipur and Datia about 30 per cent. of the local wheat crop consists of this sub-species. This distribution is somewhat striking contrast to conditions in the north and north-eastern Rajputana States of Alwar, Dholpur and Karauli where soft reds of the *vulgare* species greatly predominate and *durums* are not cultivated at all.

White or amber *durum* is very largely grown over a belt of country which extends across Central India embracing the Malwa plateau and the west of the Central Provinces. It forms the greater portion of the crop in Central India whereof the States of Dewas, Indore, Sailana and Dhar are the main producers. The proportion of white *durums* to the total wheat crop ranges from 33 per cent. in Dhar to nearly 90 per cent. in Dewas. In Alirajpur and Barwani States, however, the proportion of white *durum* falls to 12 and 20 per cent. of the total crop while approximately half of the total production consists of red *durum*. Besides being of great importance in the Bombay Presidency *durums* are also cultivated in most of the wheat areas in Hyderabad (Deccan). Outside the Peninsula *durum* wheat is seldom encountered. A few isolated tracts in the Malda and Rajshahi districts in Bengal grow small quantities of *durum* and there is a limited area in the neighbourhood of Sialkot and Gujranwala districts in Northern Punjab.

The total estimated production of *durum* wheat in India is about 1,150,000 tons. Its main distribution is approximately as follows. About 1.25 million acres, or roughly 36 per cent. of the total area devoted to wheat cultivation in the Central Provinces, are estimated to be sown with this species and the average local production amounts to nearly 230,000 tons. In Hyderabad (Deccan) the production of white and red *durums* in 1935 amounted to about 85 per cent. of the crop representing some 132,000 tons. In Bombay, Central India and Rajputana the estimated production of *durums* may be reckoned as approximately 386,000, 135,000 and 140,000 tons respectively. The quantity grown in the south of the United Provinces and elsewhere is almost negligible.

(v) *General*.—The chief commercial qualities of Indian wheat are illustrated on the plate facing page 26 and the map on page opposite shows localities in which the various classes of wheat are grown and their relative importance. It would appear from the distribution of the various kinds that three zones of production define themselves fairly clearly.

Taking the *sharbatis* and the mixtures of white hard, semi-hard and soft wheats it will be apparent that these could be allotted the area Sind, Punjab, North-West Frontier Province, and the Western United Provinces as far as a line drawn from Bareilly to Agra.

South east of this line lies the soft wheat area of the Gangetic plains embracing the remainder of the United Provinces, Bihar and North Bengal. The soft wheat zone also extends into Rajputana

and the north of the Central Provinces, but is abruptly cut across by a strip of elevated country which mainly produces *durums* and which crosses Central India from the Marwar Plateau culminating in Bundelkhand in the south of the United Provinces. In the peninsula *durum* wheats are commonest on the black cotton soils of Bombay and the Central Provinces.

(b) *Trade descriptions*.—A large number of trade names are used in the internal wheat trade and it is significant that the most variegated commercial descriptions are probably those which are applied to the wheats grown in Central India and the South generally. In the main producing tracts in Northern India, particularly in the Punjab and Sind, only three or four trade names are recognised, and while somewhat similar conditions prevail in the Western United Provinces the nomenclature tends to become more diverse farther east and south.

The fact that there are so few names in the great surplus areas in Northern India indicates that variations between types and qualities are not very pronounced and the degree of comparative uniformity which exists in the crop of those regions finds little or no counterpart in other parts of India.

In the southern wheat tracts of Central India, Bombay and the Deccan where soil and other natural conditions are responsible for the somewhat wide range of qualities grown, a complex trade nomenclature has developed which is by no means free from confusion. For example, the soft or semi-hard *vulgare* types grown in the Aurangabad district in Hyderabad (Deccan) are known in the immediate locality as *potia* (literally "spotted" or "mottled"). In Jalna an adjacent district the same wheat is called *pissi* while in Hyderabad City it is recognised as *sharbat*. Another instance may be cited. White or amber *durum* wheat with a 25 or 30 per cent. admixture of red grains is known in the Nizam's Territory as *kathia*—a term which in the Central Provinces and Bombay would be applied to red *durum* only or to *durum* carrying a predominating proportion of red grains.

A large number of synonyms also exist particularly in the southern regions. Amber *durum* wheat for instance may be called *mundi*, *mundia*, *mundwa* or *munde* in the same province. The soft white *pissi*, a term in common use throughout Central India and Bombay, becomes *pissia* in the United Provinces. In Bihar and Bengal *dudhia* a white wheat is synonymous with *dudhi* (the word derives from *dudh* = milk). *Kathia*, the name generally given to red *durum* in the Central Provinces and in the adjacent districts in the south of the United Provinces, becomes *kathe* or *katha* in the Bombay Presidency. *Gehun* a generic designation covering wheat as a whole in the United Provinces and Bihar and in the Eastern Punjab is applied particularly to white or amber *durum* in the Nimar district in the west of the Central Provinces, and to mixed *durum* in the Nagpur zone in the east.

(i) *Hard and semi-hard white wheats (Triticum vulgare)*. *sharbat*.—The literal translation of this word is "of pink colour" and when used in the wheat trade in Northern India, as will be clear

from Appendix VI, the term is applied to the superior hard or semi-hard white wheats, mainly of the improved varieties, in the Punjab, in Sind and in the United Provinces. Hence it has gradually come to be regarded as an attribute of superiority in the North. *Watni sharbati* is sometimes used in the extreme north of the Punjab to describe hard white wheat. The description *sharbati* is also by no means uncommon in the Hoshangabad, Jubbulpore and Satpura wheat zones in the Central Provinces and has a close association with local improved varieties such as A-115, A-113 and A.O.-90 which are similar in general characteristics to the Punjab types from which they were evolved. *Sharbati* wheat from Sind and the Punjab is shipped to Bombay, Calcutta and, to a lesser extent, to Madras and the term is well known in those cities, as also in a few parts of the Bombay Presidency adjacent to Bombay port whence arrivals by sea are re-exported to the interior by rail.

In Hyderabad city in the Deccan, contrary to the most common use the term *sharbati* is applied to the soft white wheat grown in and imported from the Aurangabad district in the north west of that State. More than one-third of the wheat area in the Punjab is now under improved types of which the production of some nine-tenths may be considered as falling within the *sharbati* classification. Having regard also to the amount of wheat which qualifies for this description in Sind and the United Provinces and in the Central Provinces it may be reckoned that the total amount of wheat marketed in India as *sharbati* is somewhere in the neighbourhood of 600,000 tons.

Dara is literally a "heap" and since the process of making a heap implies the blending or mixing of several lots of wheat each containing varying proportions of foreign matter, red and white, hard and soft grain, its nearest equivalent is "fair average quality". In Northern India *dara* is used in contradistinction to *sharbati* and in many parts it may be prefixed by the name of the market whence the wheat comes. The practice is very common in the United Provinces. Merchants who have traded for long periods at certain markets have come to recognise the various *daras* or fair average qualities of individual markets. The composition of *dara* will naturally depend upon the predominating characteristics of the grain grown in that area. In certain tracts where soft white wheats predominate, as for example, in some of the western and most of the central parts of the United Provinces the local *daras* must obviously possess different characteristics from the *daras* of Lyallpur or Okara in the Punjab Canal Colonies where hard and semi-hard wheats are predominant.

When *dara* contains a larger proportion of white than red grains it is known in the Punjab as *khara dara* but when the percentage of red is higher it is called *lal* or *mundi dara*. On an average *dara* sells about 2 annas per maund, or about 4 per cent. at current values, below *sharbati* although the differences may range from 1 to 4 annas per maund. The term *dara* incidentally is not encountered anywhere outside Northern India.

Karachi Bangla is the description by which the average type of Sind-Punjab wheat is known in the Bombay (port) market and the name is also recognised in a few of the interior markets near the port. This wheat, a mixture of hard, semi-hard and soft, is tenderable in the "forward" or "option" market in Bombay and is popular with the local milling industry.

Chandausi is the name given to the semi-hard white wheat grown in the locality of the town of that name in the west of the United Provinces. It is regularly quoted in the Calcutta market where it may fetch a premium ranging from 1 to 3 annas per maund over fair average quality, Cawnpore or Punjab wheats. It is interesting to observe that this trade name also occurs in Udaipur and Partabgarh in Rajputana and its application to the relatively small quantities of semi-hard wheat grown in those States would seem to imply that at some time or other seed has been imported by members of the *Marwari* community trading in Chandausi whose homes are in those parts of Rajputana.

In Baroda, on the other hand, a type of soft white wheat rather resembling the Central Provinces' *pissia* is known locally as *chandusi*.

Bot is the local trade name given in the Nagpur area and in the east of the Central Provinces to hard or semi-hard white wheats generally identifiable as Pusa 4 and Pusa 100. It would appear also that the small amount of Pusa 52 which is still cultivated in the locality is also known as *bot*. As the total amount of wheat estimated to come under this classification is only about 5 per cent. of the production of the Nagpur zone, it will be seen that its commercial importance is very limited.

Pusa is a recognised trade description for Pusa 4 grown in the Bombay Deccan. Its use is purely local. In Bihar where Pusa 52, a soft white wheat, is the predominant improved variety it is marketed as an unclassified wheat. *Dandi* is the name given to the semi-hard white wheat grown in Bihar.

Potia (spotted or mottled) is strictly speaking not the designation of a class but the description of a defective structure in hard or semi-hard wheat. Mottling denotes that a portion of the wheat kernel has lost its translucence and has become opaque, soft and starchy. This is clearly visible and in the southern wheat tracts where hard wheats predominate it is regarded as a defect and classified accordingly. In Bhopal and Baroda the term *potia* is applied to these unevenly structured wheats and the word is also used by the trade in Hyderabad to describe the soft white wheats grown in the Aurangabad district in the north west of that State.

(ii) *Soft white wheats (T. vulgare)*. *Pissia* and its variations *pissia* or *safed pissia* is a widely used trade description applied to soft white wheats, throughout Central India, the Central Provinces and the Deccan as well as in the south of the United Provinces and in the east and south-eastern Punjab. In the central and southern

wheat tracts the term in general use is *pissi* while farther north the soft white wheats are known only as *pissia* or *safed pissia*. *Safed pissia* or white *pissia* is mostly used in the Central United Provinces but *pissi* is also encountered in the eastern parts of that province. The word apparently originated in association with the wheat grown in the Narbada Valley in the Central Provinces and *pissi* is often understood to refer only to the wheats of the Jubbulpore, Hoshangabad and Satpura zones. *Farm pissi* is a classification of more or less local usage only in the Central Provinces and refers to the improved soft wheat grown from seed produced on government farms or by selected growers to whom pure seed has been issued by the Department of Agriculture.

Safed gehun, literally 'white wheat', is a general term used mainly in the Western United Provinces and applied to all soft wheats. In parts of the Central Provinces, however, *gehun* refers only to *durum* wheat. This will be discussed later.

Dara.—The use of this general trade description for fair average qualities has already been touched on and it only remains to add that the term as used in the United Provinces is always associated with mixtures of white and red wheat in which soft kernels predominate. *Gajer* is another term used as a synonym for *dara* in the west of the Central Provinces, Rajputana and Central India*. *Chandausi* is apparently used in Baroda only as applied to a soft white wheat. *Potia* has already been referred to and is used to describe a white wheat of uneven texture in parts of Central India and the Deccan.

Choice white Karachi is the name by which the wheat exported abroad through Karachi and having its origin in Sind and/or the Punjab is known in international markets. The varietal composition of this trade description is not constant and consists of fair average qualities of hard, semi-hard and soft wheat described under *Dara* with possibly a sprinkling of *sharbat*. A tolerance of 30 per cent. of red grains is allowed under the local export and mills' contracts. This corresponds with the terms of the London Corn Trade Association contract on the basis of which all the wheat exported from India to the United Kingdom is sold. With the concentration of the wheat export trade in Karachi since the early years of the present century, old trade descriptions, such as *club No. 2* for United Provinces soft white wheat formerly shipped from Calcutta, etc., have disappeared and are no longer of any practical significance.

On the whole, *choice white Karachi* is similar to the type of wheat used by the local milling industry and corresponds closely to *Karachi Bangla*, the description given to average quality Sind and Punjab wheats in Bombay, the only difference being that wheat for export is dressed over rather more carefully and is somewhat cleaner than wheat destined for general use in India.

*It is interesting to observe that a variant of this word—*gajra*—is used in Hyderabad (Deccan) to denote a red *durum*.

(iii) *Hard or semi-hard red wheat (T. vulgare)*. **Lal kanak*.—This designation is used for hard or semi-hard red wheat in the Canal Colonies and in the east and south-east of the Punjab but *desi kanak* refers to the red hard wheat grown in the north of the Punjab although there is no indication of this in the literal meaning of the words, for *desi* signifies local or indigenous. *Watni kanak* has the same significance and appears only to be used in the west and south-western wheat tracts of the Punjab. *Lal dara* or *mundi dara* are the names given in northern Punjab to mixtures of red and white wheat when the former predominates. *Bhal* is a hard red wheat grown on a small scale only in the north of the Bombay Presidency.

(iv) *Soft red wheats (T. vulgare)*. *Desi lal* commonly refers to soft red wheat in the western and central tracts of the United Provinces while *lalia gehun* is the trade name used in the east of the province. *Lal pissi* is the commonest trade description for soft red wheat in Bundelkhand and in the extreme south of the United Provinces generally and it is also in common use in the Central Provinces. *Lalka* or *jamali* are trade names indiscriminately used in east Bihar to denote the soft and hard red wheats grown in those parts. The same terms are used in Bengal for soft reds. *Jogra* or *jogia* refers to Bihar *desi* or local wheats composed of mixtures of hard and soft red and white grains with red predominating. *Wajia* or *bajia* literally means soft and is a trade description for the red wheat grown in Gujerat, in the north of the Bombay Presidency and in Baroda State.

(v) *White or amber durum wheats. (Triticum durum)*.—*Malwi*, a trade description common in Central India and the Bombay Presidency, is the name given to the *durum* grown in Malwa in Central India. The grains of this wheat are usually large and of a dark amber colour. The great bulk of this group is grown in Central India and the Peninsula. Both amber and red *durums* are produced in the same areas although the latter predominate in Rajputana, Bundelkhand, Bombay and in the Deccan generally.

Khandwa is the amber *durum* wheat exported from and through the Nimar zone of the Central Provinces and is a description common throughout Bombay—and in the south of India generally—where its local form is usually *Khanduva*. The trade description '*Khandwa*' originates from the railway station of that name situated in the west of the Central Provinces on the G. I. P. main line linking the north with the south. In the days before the Central India States and the Malwa Plateau were joined by rail to the main system running down to Bombay, Khandwa as the nearest station to the upland tracts growing *durums* in Central India became the main despatching centre at which supplies assembled by road. The name still persists although most of the wheat by which it is known does not come from the immediate locality.

*The word *lal* signifies 'red' and with its variation *lalia* is usually prefixed to the generic terms for wheat such as *kanak* and *gehun*. In the Punjab, *lal kanak* is red wheat, while in the United Provinces, *desi lal* and *lalia gehun* have the same significance.

Bansi is a trade description current throughout the Central Provinces, Deccan and Bombay and in parts of Central India, e.g., Barwani State for high grade amber *durum* wheat. The term is always associated with the best qualities as regards plumpness, general appearance, consistency and hardness. *Bansi* forms about 30 and 10 per cent. of the production in the Berar and Nimar zones respectively while in Hyderabad over 11 per cent. of the 1934-35 crop was estimated to be of this quality.

Bakshi is synonymous with *bansi* but is more commonly used in Bombay and the Deccan. Both names are often used to denote an identical quality of wheat. *Bakshi* is also used in Berar but it does not seem to be in vogue in other parts of the Central Provinces. In Bombay (Nasik district) it is often customary to prefix the word *piwla* or *piwla* (yellow) to *bakshi* to distinguish white or amber *durum* from the red variety.

*Jalalia** is the name given to a somewhat short, thick large grained type of yellow or amber wheat, strongly resembling *durum*, found in the Hoshangabad, Nimar and Berar zones in the Central Provinces. It was at one time the chief crop of the Hoshangabad district but since the opening of the railway in 1870 it has been largely replaced by *pissi* wheat. *Jalalia* may on occasion contain fair percentage of kernels belonging to the sub-species *vulgare*. The description *jalalia* is not very widely used save in the Central Provinces and parts of Central India and it should be noted that the wheat thus designated is usually not as regular in texture as *durum* and contains a proportion of soft or mottled white grains. It has been classified in the Central Provinces report as belonging to the sub-species *T. turgidum* but the distinction between the *turgidum* and *durum* sub-species appears to be difficult to establish in the grain and the Howards in their book "Wheat in India" have drawn attention to the very great difficulty of distinguishing between members of these two groups as follows :— "the consistency and shape of the grains in the latter groups so closely resemble the former that it is a matter of personal opinion to which of these classes certain wheats may be assigned".

Safed kathia or white *kathia*—the word derives from *katha*—'hard'—is the name by which white or amber *durum* is known to the trade in Bundelkhand and the southernmost tracts of the United Provinces, in Kotah, Bhopal (Rajputana and Central India respectively) and in Hyderabad (Deccan). Elsewhere *kathia* always denotes red *durum*.

Gahun is a generic term for wheat of all kinds and used in its correct sense in northern India and applies to only a mixture of white or amber *durum* with red, in the Chhattisgarh district in the east of the Central Provinces. In other parts of this province *gehun* refers to red *durum* only.

Haura or *Howra* is an amber *durum* grown in the Satpura and Nagpur zones in the Central Provinces of which it forms respectively some 10 and 30 per cent. of the local production. The term does not appear to be used by the trade outside the Central Provinces.

*Literally 'something grand'.

It was formerly known by the trade name of "Nagpur Yellow" and was exported in the early years of the present century to the Mediterranean countries where it was used for Macaroni, Semolina, etc.

Piwla gehun is mainly used in the Nasik district of the Bombay Presidency to denote the yellow or amber *durum* grown locally.

Kathe or *kate* is another trade description for the *durum* grown in the Ahmednagar district in Bombay and is mainly current in the southern parts of the Presidency, while *katha* is the name given to a similar type of wheat produced in the Nasik and Khandesh districts in the same province. *Sudhe* or *sudhi* is usually a mixture of amber and red *durum* with the former predominating and the name given to the wheat grown in the Ahmednagar district. *Munde* is another general name for amber *durum* grown in Bombay.

Piwla or *Pivla*—literally yellow—is either used as a prefix or by itself to denote an amber *durum*. It is a general term used loosely in Bombay and Hyderabad to describe the amber *durums* grown in the Deccan.

Daudpuri is the trade name by which amber *durum* containing an admixture of about 10 per cent. of red *durum* is known in the Bid and Osmanabad districts of Hyderabad. An alternative—*bagad*—is however in vogue in Nanded and Parbhani districts in the same State. When the proportion of red *durum* admixture is 25 or 30 per cent. the same wheat is called *kathia*, a term which in the Central Provinces is applicable to red *durums* only.

Kony or *kahni* is the local name given to the amber *durum* grown in South Sind. The quantity produced is very small and is mostly used locally for preparing *semolina*. It occasionally becomes mixed in other kinds of white wheats but it is not appreciated by the roller mills at Karachi owing to its flintiness and a penalty is imposed in all local mill or export contracts, should the percentage of *kony* exceed 5.

Gangajali or *Kheri* are names given to *durums* grown in small quantities only in the Malda and Rajshahi districts of Bengal. The local *gangajali* should not be confused with the *gangajali* of the Barabanki district in the Central United Provinces. The latter belongs to the species *T. vulgare*.

In Central India and Rajputana a very large number of trade descriptions for *durums* exist, as will be seen from the following table. Most are of local importance only and are seldom recognised or used outside the confines of the State or area in which they are current.

Trade names of white or amber durum in Rajputana and Central India.

RAJPUTANA.

Kotah	.. <i>Safed Katha.</i>	Partabgarh	.. <i>Davatkhani.</i>
Banswara	.. <i>Davatkhani.</i>	Udaipur	.. <i>Pakwani.</i>

CENTRAL INDIA.

Indore	..	<i>Khandwa.</i>	Bhopal— <i>contd.</i>	..	<i>Maksi</i>
		<i>Bombay Pass.</i>			<i>Kalabal.</i>
		<i>Bichalgarh.</i>			<i>Kathia.</i>
		<i>Chalu.</i>			<i>Potia.</i>
		<i>Potia.</i>	Tonk	..	<i>Kathia.</i>
		<i>Kalabal.</i>			<i>Dhosala.</i>
Bhopal	..	<i>Davatkhani.</i>			<i>Barwani.</i>
		<i>Jalalia.</i>			<i>Bansi.</i>
		<i>Bombay Pass.</i>			<i>Kalabal.</i>

Davatkhani is probably a variant of *daudkhani* and means "food for feasts" thereby implying superiority. *Pakvani* is derived from *pakvan* meaning "confectionery" and refers to the suitability of the wheat for making confectionery. In Indore *chalu* is the local equivalent for *dara* or fair average quality, while *potia* implies that the wheat is spotted or "mottled" and that its consistency is variable.

(vi) *Red durum wheats.* *Kathia* is the name most commonly given to red *durum* throughout Central India and the Peninsula, while in Bundelkhand the prefix *lal* (red) is usually added. *Gehun*, as already stated, is used in the Nimar zone and in the Chhattisgarh area in the Central Provinces to denote red *durum*. *Chawalkata* is the trade description given in the Nagpur district to a mixture of *haura* (amber *durum*) and *kathia* (red *durum*).

*Gaorani** is the name given in Berar and Hyderabad to red and mixed *durum* in which red predominates but *bagad* and *gajra* are also common local terms in Hyderabad for somewhat similar qualities.

Bijapur or *kemp godi* refer to the red *durum* grown in the Carnatic in the southern half of the Bombay Presidency and are transmuted into *cheloguthia* or *passmal* in Madras into which province this wheat is imported from Bombay in appreciable quantities.

Red *durum* is commonly referred to in Rajputana as *katha*, occasionally as *gehun* or *lal gehun*, and in this respect the local nomenclature is somewhat akin to that adopted in the Central Provinces. In Indore *khandwa* wheat, if tinged slightly red, is known as *halka*. In other parts of Central India where red *durum* is grown, as for instance in Alirajpur and Barwani, it is known as *lal katha* and *lal* respectively.

(vii) *Emmer Triticum dicoccum*.—This wheat is only found in south India and particularly in the Carnatic in Bombay and its trade name almost everywhere in south India as *khaplī*. In Madras it is also called *samba*. In Hyderabad (Deccan) the common trade description is *jod gahu*.

*Literally 'Queen of wheats'.

(viii) *Summary.* The following is a summary of the main characteristics of some of the more important trade descriptions in general use :—

*White wheats** (*T. vulgare*).—

Sharbati.—Small to medium sized, white grains, semi-hard to hard, slightly opaque to translucent, containing a low proportion of red grains. It contains less than .25 per cent. foreign matter on an average. Bushel weights range from 61.20 lbs. for United Provinces *shurbatis* to 63.79 lbs. for the Central Provinces product. The average bushel weight for the Punjab *sharbatis* is about 62.25 lbs., while the weight per 1,000 kernels averages 32.5 grammes. Protein content is not less than 9 per cent. and averages about 9.25. This term is in common use in the trade and has a similar kind of meaning in the following areas :—

- (i) Sind, (ii) Punjab, (iii) Western United Provinces and most of the large consuming centres in Northern India including Bihar, which import this wheat, (iv) the Nerbuda Valley and the Northern wheat zone of the Central Provinces, (v) Alirajpur State in Central India, (vi) a few large consuming centres in the Bombay Presidency near Bombay port, and (vii) Calcutta, Bombay and Madras ports.

Dara.—Small grained mixtures of hard and soft white wheats containing a relatively greater proportion of red grains than *sharbati*. Usually less clean—foreign matter varies from .26 per cent. in the Punjab and .40 per cent. in the United Provinces to 2.64 in Rajputana—and not so well filled or plump as the latter. Bushel weights range from 59.95 lbs. for Sind to 62.76 for Central India *dara*. In the Punjab and the United Provinces the average bushel weight is 61.69 and 61.95 lbs. respectively. Weights per 1,000 kernels are variable and less than in the preceding class. The average for the Punjab is 31.99 grammes, that for the United Provinces is only 31.22 grammes, Sind and Bihar are even lower at 29.65 and 30.47 grammes respectively. Rajputana fair average qualities have a higher specific weight and average 34.85 grammes. Protein content is also variable and ranges from 8.58 per cent. for Bengal samples to 10.03 for Sind. In the Punjab and the United Provinces the respective protein values were 9.03 and 8.94 per cent. The term is in common use throughout Sind and the Punjab, and in the United Provinces.

Choice white Karachi.—Rather superior to the average *dara* qualities, like practically all the commercial types handled in India has no constant varietal composition and may consist of varying proportions of hard and soft kernels. The percentage of red grains is usually below 10. This wheat is generally carefully dressed over prior to shipment and contains on an average less than 1 per cent. of foreign admixture.

*Many of the wheats described possess every gradation in colour from white to yellow. For convenience they are grouped under the one heading—white.

Karachi Bangla.—Similar in general characteristics to *dara*. Average impurity content over 1.5 per cent. Proportion of red grains anything up to 20 per cent. This term is mainly used in the markets of Bombay port to describe “fair average quality” Sind|Punjab wheats.

Pissi.—Bold grained soft white with anything up to 30 to 35 per cent. of red grain admixture. Foreign matter over 2 per cent. Average bushel weight over 62 lbs. and weight per 1,000 kernels not below 37 grammes. Central India and Rajputana *pissis* over 43 grammes per 1,000 kernels. Protein content about 9.25 per cent. for Central Provinces *pissis* and about 10 per cent. for Central India and Rajputana types. This term is used in a somewhat similar sense in the following areas :—

- (i) Central Provinces, (ii) Bundelkhand, (iii) Central India, (iv) Bombay and Bombay port, (v) United Provinces, and (vi) East Punjab (*Pissia*).

Dudhi or dudhia.—Small grained soft white wheat with a low proportion of red grains. Bushel weight 63.40 lbs. Weight per 1,000 kernels 33.22 grammes. Protein over 8.5 per cent. This term is chiefly used in Bihar and North Bengal.

Red Wheats (*T. vulgare*).—

Desi lal.—Small to medium grained soft red and generally containing rather more barley and other food grains than white wheat. Average bushel weight 61.50 lbs. Range of weights per 1,000 kernels 32 to 33.6 grammes. Protein about 9 per cent. This trade description is employed mainly in the Western and the Central United Provinces.

Lal pissi.—Soft red. Fairly large grain. Average bushel weight 64.5 lbs. Protein about 8.5 per cent. The term is met with in (i) the Central Provinces, and (ii) Central India (Indore).

Lalka or jamali.—Small to medium grained soft and semi-hard red. Bushel weight for Bihar wheat 62.92 lbs., for Bengal 61.33 lbs. Protein content for Bihar about 10 per cent. These descriptions are used in (i) Bihar and (ii) Bengal.

Wajia or bajia.—Soft red. Small to medium grain. Bushel weight about 62.5 lbs. Protein content of the Rajputana type 9.20 per cent. The terms are confined to (i) Rajputana (Alwar, Banswara, etc.), and (ii) Gujerat (Bombay Presidency).

White, or amber wheats—(*Triticum durum*).—

Bansi or bakshi.—Large bold grained hard and flinty light amber coloured wheat containing anything up to 10 or 12 per cent. of red kernels. Dirt and foreign matter content fairly high ranging from an average of .89 per cent. in Central India to 1.75 in the

Central Provinces. Percentage of other food grain content negligible. Average bushel weight about 62 lbs. but ranges from 58 to 64.5 lbs. Average weight per 1,000 kernels about 41 grammes which compares with an average for *sharbati* (*T. vulgare*) of only 32.5 grammes. Protein content between 11 and 12 per cent. These terms are generally used in (i) the Central Provinces—Berar and Nimar zones, (ii) Bombay Presidency, and (iii) Hyderabad (Deccan).

Jalalia.—Large thick grained hard yellow or amber coloured wheat. Structure of the ordinary commercial types is occasionally rather variable with a small percentage of semi-hard or soft kernels. Other physical characteristics are the same as *bansi*. Average bushel weight roughly 63 lbs. and weight per 1,000 kernels 49 grammes with extremes of 43 and 55 grammes. Protein content about 11 per cent. The term occurs mainly in (i) the Central Provinces—Berar, Nimar and Hoshangabad, and (ii) Central India—Bhopal.

Khandwa or Khanduva.—Very bold grained light to dark amber coloured *durum* having the same general features as *bansi* except that the weight per 1,000 kernels is 4 grammes higher than *bansi* being on an average 45 grammes. Protein content between 11 and 12 per cent. The terms are mostly used in (i) Khandwa—Bombay Presidency generally and (ii) Khanduva—Madras and South Indian States.

Malwi.—Exceptionally bold large grained dark amber coloured *durum*. Bushel weight 64 lbs. Weight per 1,000 kernels 47|48 grammes. Protein between 11 and 12 per cent. This trade description is well known in (i) Central India, and (ii) the Bombay Presidency.

Piwla, pivla, peela.—Large grained yellow *durums*. Impurity content moderately high. Average bushel weight about 62 lbs. range from 61 to 63 lbs. Average weight per 1,000 kernels about 42 grammes. Protein between 10 and 12 per cent. These terms are synonymous and appear only to be used in the Bombay Presidency and Hyderabad (Deccan).

Kathe or katha.—Same general characteristics as *piwla*.

Kony or kahni.—Usually of dark amber colour. Medium bold grains. Average impurity content about .5 per cent. Average bushel weight about 61 lbs. Weight per 1,000 kernels 42 grammes. Protein content 10 per cent. Mostly used in Sind.

Wadanak*.—Comparatively small to medium sized rather long and slender amber grains. Low impurity content—below $\frac{1}{2}$ per cent. Average bushel weight about 60 lbs. Weight per 1,000 kernels 35 grammes. This word is encountered only in the Punjab—Sialkot and Gujranwala.

*Corruption of *wada kanak* (large wheat).

Red wheats (T. durum).—

Kathia or *katha*.—The Central Indian types are large bold grained hard and flinty. Average dirt content fairly high—1.7 per cent. Average bushel weight about 62 lbs. Average weight per 1,000 kernels 45 grammes. The Rajputana varieties are very bold and have an average bushel weight of approximately 63 lbs., while the weight per 1,000 kernels is 46 grammes. Impurity content averages about 1.5 per cent. and is sometimes fairly high. The Central Provinces variety known as *kathia* has on the average bushel weight of only about 61.5 lbs., and weight per 1,000 kernels of 44 grammes. The impurity content is much higher than the other red *durums* of this type and averages 2.3 per cent. Lowest protein content is 10.43 per cent. Maximum 12.94 per cent. in Hyderabad. Average about 11.5 to 12 per cent. These terms are used in (i) throughout the Central Provinces, (ii) Bundelkhand (*lal katha*), and (iii) Rajputana—Alwar, Dholpur, Banswara.

Byapur red or *kemp godi*.—Medium sized grain. Average impurity content about .5 per cent. Bushel weight 61 lbs. Average weight per 1,000 kernels 37 grammes. The term is used mostly in the Bombay Presidency—Carnatic.

Gaorani.—Medium to bold grain. Impurity content about 1.1 per cent. Bushel weight 62 lbs. Average weight per 1,000 kernels 42.5 grammes. The term is used in (i) Hyderabad (Deccan), and (ii) the Central Provinces—Berar.

Gahun.—Same general type as *khandwa*. Chiefly used in (i) Central Provinces—Nimar and in (ii) Rajputana—Partabgarh (*lal gahun*).

Emmer—Triticum dicoccum.—

Khapli.—Long slender red grain. Hard and flinty. Impurity content ranges from .32 to 1.07 per cent. Bushel weight variable from 56 to 61.70 lbs. Weight per 1,000 kernels average about 33 grammes only. The term is generally used in the Bombay Presidency (Carnatic) and in South India generally.

C.—Imports.

Australia, one of the chief world exporters of wheat, is only some 12 days sail from the main ports of India and has, since 1899-1900, been the source of about 99 per cent. of India's imports of wheat.

(1) QUANTITY.

Before the war wheat imports were small. Quinquennial averages since 1876-77 show that the highest imports were in the 5-year period ending 1900-01 and amounted to 15,000 tons. Between 1886-87 and 1890-91 imports averaged 4,000 tons. Since the war however imports have increased from 1917-18, but there have

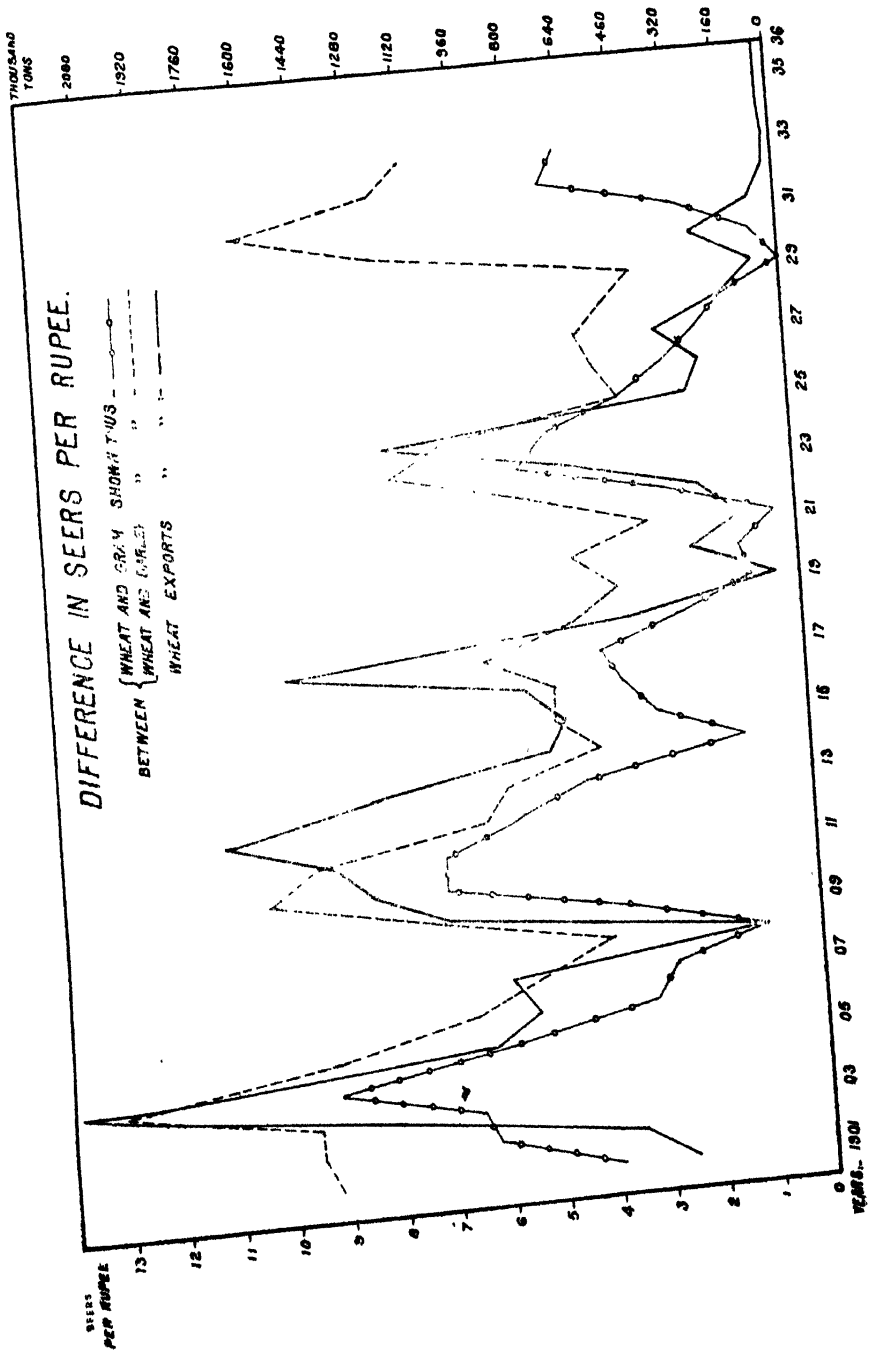
been considerable fluctuations during recent years as is evident from the following table :—

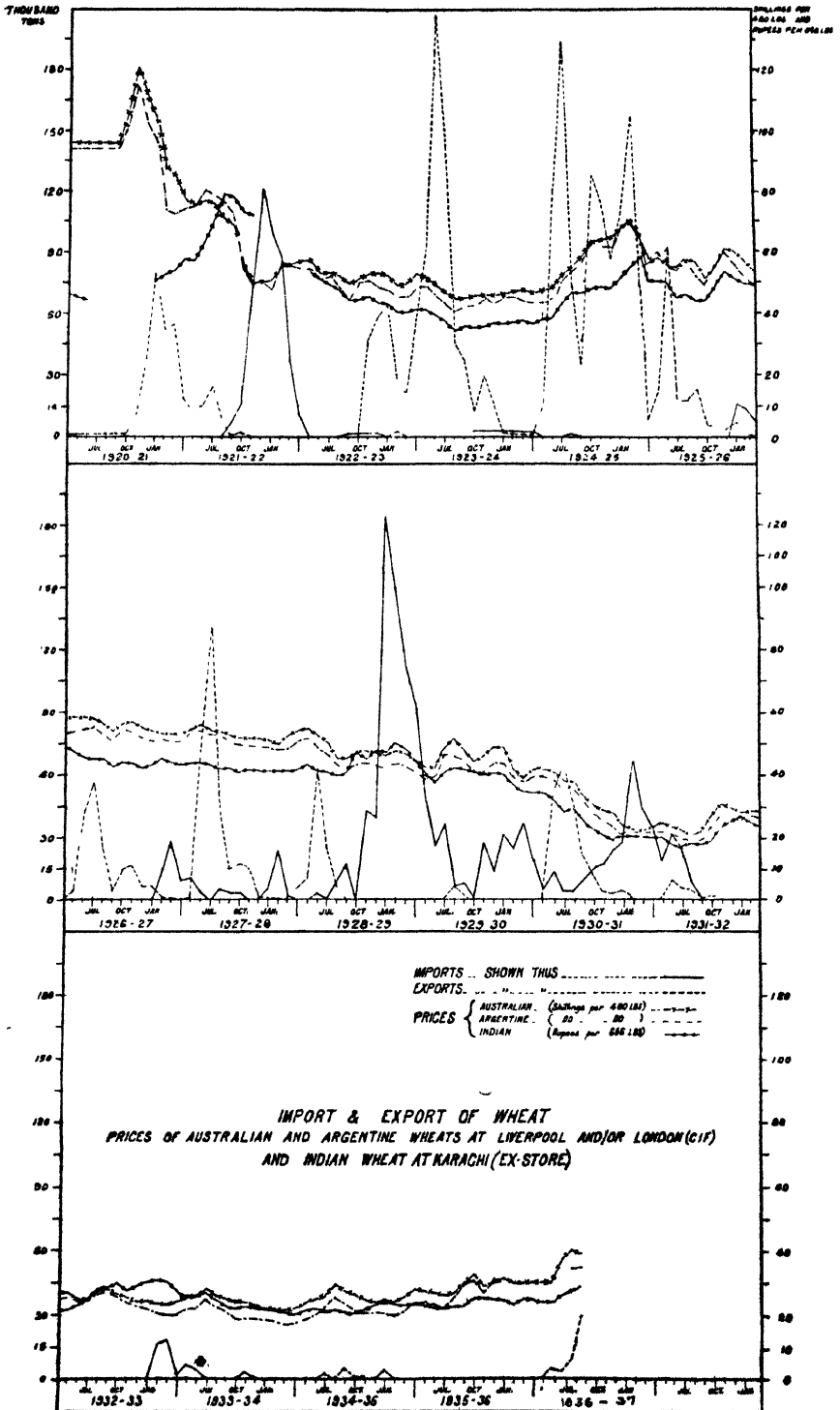
Imports of wheat into India by sea.

Year.				Thousand tons.	Year.				Thousand tons.
1919-20	..	..	..	148	1928-29	..	..	..	562
1920-21	..	..	..	..	1929-30	..	..	..	357
1921-22	..	..	..	440	1930-31	..	..	..	232
1922-23	..	..	..	19	1931-32	..	..	..	111
1923-24	..	..	..	12	1932-33	..	..	..	33
1924-25	..	..	..	4	1933-34	..	..	..	18
1925-26	..	..	..	35	1934-35	..	..	..	7
1926-27	..	..	..	40	1935-36	..	..	..	13
1927-28	..	..	..	69					

The large imports of 1921-22 followed an exceptionally poor crop of only 6.7 million tons in the preceding year. A similar reason accounts for the heavy shipments amounting to 56 million tons during 1928-29. In 1929-30 a bumper crop and negligible exports somewhat reduced the necessity to import quite such a large quantity and shipments fell to some 200,000 tons. In the following year imports further declined by 125,000 tons. Nevertheless, the quantity imported, *viz.*, 232,034 tons, was considered to be sufficiently large seriously to endanger the price of Indian wheat which had begun rapidly to depreciate in value following the collapse in the wheat markets abroad. On the 1st April 1931, therefore, the Government of India imposed a "non-protective special duty" of Rs. 2 per cwt. on all imports of wheat grown abroad and wheat flour was charged at Rs. 2-8-0 per cwt. This measure was effective in checking further imports, and if the shipments of wheat in 1931-32 are seemingly large (111,269 tons) it was due to the fulfilment of contracts entered into by importers prior to the application of the duty. On 1st April 1935 the wheat import duty which since 1933 had been classed as a "protective" duty, was lowered to Rs. 1-8-0 per cwt. on wheat and wheat flour. In 1936 a further reduction was made in the duty to Re. 1 per cwt. for both commodities and it continued at this level till the close of the year.

During the five years following the application of the duty, ample crops in India rendered imports unnecessary and they declined





to insignificant proportions. It would appear that, on the whole, imports only partly offset the exports from India. During the 10 years ending 1929-30 for example, the total exports were practically double the amount of imports.

An examination of the diagram on page 42 based on Appendices VII, VIII and XI showing imports and exports of wheat and the relation between the prices of Indian wheat at Karachi and world values as indicated by South American and Australian c.i.f. quotations in London and Liverpool indicates that a close relation exists between imports and the price margin between Indian and Australian wheats. For example, imports commenced almost immediately in September 1921 when Indian quotations rose above Australian. During the following months when the relative position of the two prices were unchanged imports continued on a very large scale until May 1922 when Indian wheat fell below Australian. Somewhat the same conditions occurred, but to a less marked degree, between December 1925 and April 1926 and again from January 1927. By the end of 1928 Indian prices rose above Australian and during the first quarter of 1929 imports were on a quite exceptionally high scale reaching the maximum in January and February, when Indian quotations were relatively at the highest point. Later on between January and April 1931, Australian and Indian values again converge and as on previous occasions the relative rise in Indian prices is accompanied by a sharp rise in imports.

Owing to the import duty which came into operation in April 1931 shipments to India were restricted and although from about August 1932 to May 1933 the Indian price level was once more relatively higher than Australian only moderate shipments were made. In February and March 1933 when Indian wheat price was at its highest level above Australian, some 33,500 tons in all were received in India.

The seasonal fluctuation in sea imports has been very irregular during recent years. The greater volume of shipments, as will be clear from Appendix VIII, arrive during the autumn and winter months. For instance, in 1930-31 four-fifths of the total annual imports were landed between October and March. In 1932-33 all the imports for the year, *viz.*, 33,482 tons arrived in February and March. In 1934-35 three-fifths of the annual imports were received in January while in 1935-36 out of 13,066 tons only 34 tons were imported in April and the whole of the remainder in December and February.

Apart from the sea imports there is a small but fairly regular import trade in wheat at certain stations adjacent to land frontier routes. (Appendix IX.) The largest importation in recent years was 13,415 tons in 1932-33 and the lowest in 1931-32 when only 4,563 tons were registered. Most of these imports are received through the North-West Frontier Province, the Punjab and the United Provinces from Afghanistan, Kashmir, Tibet, Nepal, Sikkim and Bhutan. The average annual imports from all these sources amount to a little over 8,500 tons. As a rule the greater part of this traffic

passes through the frontier stations during the three post-harvest months. This is in conformity with the general movement of wheat in the large producing areas in India proper.

(2) *Value*.—The annual declared value of wheat imported into India by sea during 1932-33 was Rs. 29,25,309 but this fell in the following year to Rs. 12,54,518 and in 1934-35 to Rs. 5,31,127. The average value of imports for the three years 1929-30|1931-32 was Rs. 2,61,88,158 or roughly 17 times greater than in 1932-33|1934-35.

The average declared value of imported wheat between 1932-33 and 1934-35 was a fraction below Rs. 4 per cwt. or about Rs. 2-15-0 per maund (82-2/7 lb.).

D.—Exports.

Owing to its dry nature and its suitability for blending, Indian wheat when available for export has always had a ready market in Europe, and more particularly in the United Kingdom. In recent years price considerations have prevented export on any appreciable scale for in spite of a preference, under the terms of the Ottawa Agreement, of 2 shillings per quarter (480 lb.) Indian wheat has very rarely been cheap enough to compete with Australian, Canadian or Argentine wheats in the United Kingdom markets.

(1) QUANTITY.

The export trade in wheat has never been very constant. Great variations have taken place from year to year. This is illustrated by the following table showing the quinquennial average exports and also the minimum and maximum from 1900-01. The annual figures are given in Appendix X.

Exports and re-exports of wheat by sea.

(Thousand tons.)

—	Average.	Minimum.	Maximum.
1900-01 to 1904-05	866	3	2,150
1905-06 to 1909-10	756	110	1,051
1910-11 to 1914-15	1,239	706	1,660
1915-16 to 1919-20	670	16	1,454
1920-21 to 1924-25	458	81	1,112
1925-26 to 1929-30	164	17	300
1930-31 to 1934-35	47	2	197

At the beginning of the century exports were relatively high. In 1904-05 following the bumper harvest of the previous season exports

reached a record figure of over 2 million tons. Except in 1908-09 they continued on a fairly high level until the last year of the war.

During the war exports were controlled by Government and at the end of 1916 purchases of wheat were made by the Royal Commission on Wheat Supplies in the United Kingdom through private agencies with branches in India. The methods of buying and conditioning the wheat prior to shipment were supervised by the Wheat Commissioner in India. From 1917 until the end of the war the control of all buying operations was taken over by the Wheat Commissioner. In October 1918 purchases for export were discontinued except for military requirements. Restrictions on private trade with other countries were removed on the 30th September 1920 and a maximum of 400,000 tons was fixed as the exportable quantity up to March 1921. A fixed price limit was established for purchases during this period, but before the end of February direct purchase and sale by Government was abandoned on account of the heavy fall in prices in the United Kingdom and Government control was released on 1st April 1921. The date also coincided with decontrol by the United Kingdom Government. Towards the end of August 1921 exports of wheat from India were again subject to restriction on account of the failure of the crop. After a further period of a year all restrictive measures were finally abandoned in September 1922.

The following table shows the post-war exports of wheat —

Exports and re-exports of wheat from India by sea.

Year.*				Thousand tons.	Year.				Thousand tons.
1919-20	..	..	..	16	1928-29	..	..	115	
1920-21	..	..	..	238	1929-30	..	..	17	
1921-22	..	..	..	81	1930-31	..	..	197	
1922-23	..	..	..	220	1931-32	..	..	22	
1923-24	..	..	..	638	1932-33	..	..	2	
1924-25	..	..	..	1,112	1933-34	..	..	2	
1925-26	..	..	..	212	1934-35	..	..	11	
1926-27	..	..	..	176	1935-36	..	..	10	
1927-28	..	..	..	300	1936-37 (9 months)			193	

It has been observed in the preceding section that the imports are closely linked with the relative values of Indian and Australian

*Year ending 31st March. It will be evident that the exports in any year consist of wheat recorded in the crop production statistics of the previous year.

wheats. The converse appears to be the case with exports and it is important to note that exports do not necessarily expand as Indian wheat grows relatively cheaper.

Another explanation must therefore be sought for the rise and fall of exports. The diagram on page 41 shows the annual exports of wheat since 1901 and the differences in seers (2.57 lb.) per rupee between the price of wheat and gram and wheat and barley. It will at once be evident that a very close connection exists between the periodicity of exports and the relation between the price of wheat and the prices of the other two major *rabi* food crops. Whenever the price margin between wheat and gram or wheat and barley has been wide, wheat exports are large and *vice versa*.

Apart from a time-lag in the period 1910-12, the extent to which exports have synchronised with a relative increase in the value of wheat as compared with the other two commodities is remarkable and indicates very clearly that at a price the grower is always prepared to dispose of his wheat and fall back on the other food grains for domestic consumption. The large quantities retained by cultivators and in the villages evidently constitute a reserve stock available for export but the villager is not willing to part with this unless gram and barley are relatively cheap. The tendency is in fact to use more wheat when the price gap between wheat and these other food grains is small.

It may be observed that since 1931 the margin between wheat prices and those of barley and gram has widened without bringing about a corresponding rise in exports. This is, however, due to the effect of the wheat duty in raising the price of wheat relative to the other two, and also to world wheat prices. This effect has therefore to be discounted with reference to the margin in any attempt to forecast further export movements. The original duty of Rs. 2-0-0 per cwt. was equal to an additional margin of about 5 seers per rupee and at the present rate of duty, *viz.*, Re. 1-0-0 per cwt., the normal margin between wheat and gram prices, for example, would have to be in excess by 3 seers per rupee before having any effect on exports. This condition arose in 1936 with the result that exports between April and December that year showed a sudden rise to nearly 200,000 tons.

(2) DESTINATIONS.

By far the greater proportion of shipments from India has been and is still bought by the United Kingdom. During the last quarter of the nineteenth century France, Belgium and Italy were fairly regular customers in that order of importance. In 1891-92 for instance these three countries between them took 5,86,000 tons as against 6,17,000 tons exported to the United Kingdom. The normal proportion of Continental takings was however about half the average shipments to Great Britain before the opening of the present century, but this proportion diminished noticeably after 1900-01. During the past five years, exports to Continental Europe have almost entirely disappeared and in fact there were no shipments at all to the Continent in 1933, 1934 and 1935. The following table

summarises the position :—

Destinations of wheat exported from British India and the share of the United Kingdom.

(Thousand tons.)

Year.	Grand Total.	United Kingdom.	Other British Possessions.*	Continental Europe.†	Other foreign countries.‡	Share of United Kingdom.
1925-26 ..	211	104	34	27	46	Per cent. 49·3
1926-27 ..	177	141	7	23	6	80·0
1927-28 ..	299	251	3	41	4	80·0
1928-29 ..	114	76	2	16	20	66·5
1929-30 ..	13	7	2	..	4	53·8
1930-31 ..	196	175	1	14	6	89·3
1931-32 ..	20	17	1	..	2	85·0
1932-33 ..	3	..	2	..	1	..
1933-34 ..	2	..	1	..	1	..
1934-35 ..	12	9	2	..	1	75·0
1935-36 ..	10	7	2	..	1	70·0

(3) PERIODICITY.

The periodicity of exports by sea, unlike that of imports, is very marked. As will be observed from Appendix XI the bulk of the year's shipments are normally effected soon after the harvest, namely in June, July and August and it has sometimes been asserted that European buyers try to avoid Indian wheat as far as possible after October or November owing to the fear of weevilled grain. This, however, is not entirely borne out by statistics which show that exports have on occasions been quite large during the latter part of the season. This was a noticeable feature not only in 1920-21 and in 1922-23 but also of the heavy export season of 1924-25 when almost a half of the whole year's exports of 1.11 million tons was handled between November and March.

* Aden, Bahrein Islands, Ceylon, Straits Settlements, Hongkong, Natal, Zanzibar, Kenya, Tanganyika, Mauritius.

† Mainly Belgium, France and Italy in that order of importance.

‡ Crete, Syria, Maskat Territory, Other native States in Arabia, Iraq (shown as foreign country since 1927-28), Persia, Java, Siam, Japan, Egypt, Portuguese East Africa, Italian East Africa, French Somaliland, United States of America.

(4) EXPORT CHANNELS.

The opening of the Suez Canal in 1869 gave a great stimulus to the wheat export trade by shortening the route to Europe and cheapening the costs of transport. A minor contributory factor was also probably the abolition in 1873 of the export duty of 3 annas per maund.

In the early years of the export trade the Punjab and the western districts of the United Provinces were not the important surplus areas which they are to-day. It was only the development of irrigation which secured for the Punjab its predominating position in wheat production, and since the opening of the Lower Chenab Canal in 1887, the irrigated area under wheat has doubled itself in the Punjab. These changes in production are reflected in the increased exports through Karachi from about the end of the last century. Formerly, Calcutta and Bombay were the main outlets for Indian wheat and these two ports respectively tapped the resources of the East United Provinces and Bihar and the rich wheat growing tracts in the Central Provinces. It is unlikely, however, that Calcutta will ever again assume importance as an exporting centre but it is possible that in a year of large exports a certain amount of wheat may be attracted to Bombay from the United Provinces, the Narbada Valley and from Central India.

The following table shows the manner and extent to which the wheat export trade has changed direction :—

Average annual Wheat exports.

(Thousand tons.)

		Bengal ports, mainly Calcutta.	Bombay ports, mainly Bombay.	Sind ports mainly Karachi.
1870-71 to 1874-75	.. ..	14	13	..
1875-76 to 1879-80	.. ..	122	37	17
1880-81 to 1884-85	.. ..	252	396	134
1885-86 to 1889-90	.. ..	200	476	206
1890-91 to 1894-95	.. ..	107	346	334
1895-96 to 1899-1900	.. ..	73	158	235
1900-01 to 1904-05	.. ..	169	101	419
1905-06 to 1909-10	.. ..	85	72	648
1910-11 to 1914-15	.. ..	112	145	983
1915-16 to 1919-20	.. ..	42	85	541
1920-21 to 1924-25	.. ..	4	17	436
1925-26 to 1929-30	.. ..	2	11	150
1930-31 to 1934-35	.. ..	..	1	45

(5) LAND FRONTIER TRADE.

On an average for the period 1930-31|1935-36 exports of wheat from India through stations adjacent to land frontier trade routes have been approximately four times as great as the corresponding imports (Appendix IX). More than three-fourths of this trade passes

into Afghanistan and Kashmir and through those territories into Central Asia and Turkestan.

The heaviest exports of the last 3 years were 41,034 tons in 1933-34, and the lowest 27,666 tons in 1935-36. The average annual exports through these channels are a little under 40,000 tons. Periodicity in the land frontier trade is not very clearly defined but the average exports from May to August exceed that of any other consecutive 4 months.

(6) VALUE.

The declared value of exports by sea during 1934-35 was Rs. 10,60,578. In the previous two years it averaged Rs. 3,54,614. It is interesting to compare these figures with 1924-25 when the value of the 1.11 million tons exported attained the record figure of Rs. 17,19,49,952. On the basis of the total declared value of exports in 1935-36 the value per cwt. was a shade over Rs. 4-15-0, *i.e.*, about Rs. 3-10 0 per maund. This compares with an average value per maund of Rs. 4-4-6 for the three years 1932-33|1934-35. (These figures are in excess of the current wholesale prices as they include all charges up to f. o. b.). There are no records to show the value of wheat exported by land frontier trade routes.

Note.—Of the foreign possessions in India the chief ports are Goa, the Portuguese Colony on the Malabar coast and Pondicherry, the French port on the Coromandel coast. Their trade with foreign countries in respect of wheat and wheat products is practically negligible. For instance, a 5-year period average (1930-31|1934-35) of imports and exports of wheat flour by French possessions from and to foreign countries shows that 45 tons were received and barely 3 tons shipped. The trade with Indian ports (by sea) was 61 tons of imports and 1 ton of exports. Coastal traffic by sea accounts for the bulk of the trade in the Portuguese possessions of Goa, Diu and Damaon. Imports of wheat in 1933, the last year for which figures are available, show 1,915 tons of which 98 per cent. comes from Bombay, while imports of flour during the same period totalled 1,955 tons almost entirely from the same source. The export and import trade through Indian States, *e.g.*, Travancore, Cochin and the Kathiawar States is of small dimensions. So far as wheat and wheat products are concerned, therefore, the figures given in the Accounts relating to the Sea borne Trade of British India may be accepted for the whole of India without correction.

E.—Wheat flour—Imports and exports.

(1) IMPORTS.

The average annual imports of wheat flour have hardly amounted to 120 tons during the past decade. The maximum receipts were 367 tons in 1935-36, the minimum in 1931-32 when only 34 tons were landed. Between 1907-08 and 1915-16 imports ranged approximately between 1,900 and 6,650 tons. For thirty years previously the average annual imports were a little more than 1,140 tons but since 1916-17 the imports have declined although there was a spasmodic revival between 1921 and 1923 when nearly 2,000 tons were shipped to India annually. The current trade is very small and consists of Australian flour landed principally at Bombay. Lately there have been signs of increased imports of Australian flour into Burma, due possibly to the lowering of the duty from Re. 1-8-0 to Re. 1-0-0 per cwt. but the quantities are still comparatively insignificant.

(2) EXPORTS.

The export of wheat flour was till recently a trade of appreciable dimensions, but during the past three or four years the average quantity exported has dwindled to less than one-fourth of what it was during the 3 years 1925-26 to 1927-28.

During pre-war years exports ranged from approximately 25,000 tons in 1900-01 to 79,000 tons in 1913-14 but there was no well defined or consistent trend except for the 5-year period immediately preceding the outbreak of the war when there was a steady increase each year, exports rising from about 35,000 tons in 1909-10 to 79,000 tons in 1913-14 (Appendix X). During the four years of the war exports averaged some 64,000 tons annually, but declined in 1918-19 to 31,000 tons.

The following table records the position for the past ten years in detail :—

*Exports of wheat flour from India.**

Year.	Thousand tons.	Approximate share of British Empire.	Year.	Thousand tons.	Approximate share of British Empire.
		%			%
1925-26 ..	67	56	1931-32	43	55
1926-27 ..	59	51	1932-33	21	58
1927-28 ..	60	51	1933-34	13	60
1928-29 ..	54	46	1934-35	12	64
1929-30 ..	51	47	1935-36	18	..
1930-31 ..	47	50	1936-37 (9 months).	13	..

The decline in exports is very striking, but there appears to be no particular significance in the increasing proportion recently taken by countries within the British Empire.

(3) DESTINATIONS.

As will be seen from Appendix XII, Aden and its dependencies, Ceylon, Mauritius, Kenya, Zanzibar, and the Straits Settlements used to be the chief importers of Indian flour. At the

*Annual Statement of the Sea-borne Trade of British India.

present time, however, only the trade with the Straits Settlements and Kenya can bear any comparison with former times. The volume of trade with Aden and Zanzibar in 1934-35 was only one-fifth of what it was in 1925-26, practically the whole of the Mauritius market was lost and only 6 per cent. of the 1925-26 exports to other British possessions remained in the hands of the Indian milling industry last year. As regards exports to foreign countries, Egypt which used to be by far the largest buyer of Indian flour, not excepting any British possessions, has now almost disappeared from the list of importers—likewise Iran, to which country exports have fallen from 8,379 tons in 1925-26 to a mere 13 tons in 1934-35 (Appendix XIII).

(4) PERIODICITY AND TREND.

There seems to be no marked periodicity in the exports of flour in any particular season of the year. The decline in the export of wheat flour appears to be mainly due to the dearness of Indian wheat as compared with other world wheats. It has, however, been attributed in some quarters to the operation of the wheat import duty of 1931 which by supporting the domestic wheat price above world parity has prevented the milling industry from competing in outside markets. The wheat import duty was applied as from the 1st April 1931, and subsequently imports fell heavily, except in the first year during which the mills happened to hold large stocks of cheap Australian wheat bought before 1st March 1931. Imports of wheat have since continued to decline in spite of the drawback scheme which the Government of India sanctioned in 1933 by which wheat may be imported free of duty provided the importer satisfies the customs authorities that he has contracted to sell a quantity of flour representing 87 per cent. of the quantity of wheat so imported. This relief appears to have come too late, for quasi-subsidised Australian, French and other foreign flours have in the meantime ousted Indian flour from a number of overseas markets and the ground so lost has not been regained.

Exports to Continental Europe, have, like the exports of wheat, disappeared completely during the past three or four years principally owing to the measures taken by Continental importing countries, e.g., Italy, Germany, France and Sweden to make themselves more or less self-supporting.

The reduced exports of wheat flour consist mainly of *ata** for the making of *chapatis*, to meet the demand from Indians living in East and North East Africa, Aden, etc., and a small amount of finer flours for blending with cheaper Empire or foreign products.

As will be seen from the following table, the foreign countries to which India used formerly to ship wheat have, with one exception—Belgium—imposed increasingly heavy customs duties on the import of cereals and flour. The import of wheat into Belgium although still duty-free is, however, subject to license.

*Whole meal flour.

Import duties on wheat and wheat flour in certain foreign countries.

	1929.		1931.		1936.	
	Wheat.	Flour.	Wheat.	Flour.	Wheat.	Flour.
Germany (RM per 100 kg.).	5	12½	25	51½	35	59-5/6
Italy (lire per 100 kg.)..	40·40	74·50	..	..	75	115
France (francs per 100 kg.).	35	..	80	..	160	..
Bolting :—						
70% or more (a)	..	60	..	128	..	265
(b)						128
60%—70% (a)	..	72	..	..	..	320
(b)						160
Less than 60% (a)	..	80	..	..	..	370
(b)						185

F.—Other wheat product imports.

Imports of special cereal foods such as macaroni wheat flakes, shredded wheat, etc., are included along with other miscellaneous products and the amount has not so far been ascertained. In regard to biscuits and cakes the annual imports into India, including Burma on the average of the 5-year period 1930-31|1934-35 were 2,072 tons of which 865 tons or over 40 per cent. were taken by Burma alone. Imports were predominantly from the British Empire, the United Kingdom alone accounting for 1,500 tons annually or almost three-fourths of the average imports. The Straits Settlements (mainly Singapore) ranks second with an average of 461 tons but practically all the shipments from this source find a market in Burma.*

Imports of biscuits and cakes as will be seen from the following table show a distinct rise in the autumn and winter months and are at their lowest in June and July.

Imports and values of biscuits and cakes.

					Tons.	Rs.
1935	April	..	..	..	184	2,46,707
	May	..	..	..	200	2,69,683
	June	..	..	..	174	2,42,639
	July	..	..	..	204	2,52,177
	August	..	..	..	256	3,12,687
	September	..	..	..	222	3,08,765
	October	..	..	..	295	3,65,587
	November	..	..	..	281	4,15,868
	December	..	..	..	279	4,03,509
1936	January	..	..	..	220	2,83,717
	February	..	..	..	205	2,29,387
	March	..	..	..	217	2,61,571
		Total	..	..	2,737	35,92,297

(a) General duty.

(b) Conventional duty.

*On an average of the 5-year period 1930-31|1934-35 Burma imported 454 tons from the Straits Settlements out of total shipments from that source to British India as a whole of 461 tons.

The importation into Burma of biscuits manufactured in Singapore has a very definite periodicity in contrast with biscuits made in the United Kingdom. Imports from the Straits rise during August, October and March as the type of biscuits in demand is used mainly by Burmans during the Buddhist Lent from July to October and for the important religious festival in March.

Imports seem gradually to be on the upward trend again after a sharp fall between 1930-31 and 1931-32 and there has been a progressive increase since 1932-33. The latest figures available indicate that 2,737 tons were imported in 1935-36 as compared with 1,786 tons in 1932-33.

G.—Total and net available supplies of wheat and wheat products.

In Appendix X are shown the total supplies of wheat available for consumption during the past 35 years after taking into account the local production and imports and exports (including re-exports) of wheat and flour (in terms of wheat) by sea. The trade by land frontiers, small as it is, has not been included. The position in respect of the last two years is summarised in detail in the following table:—

	1934-35.		1935-36.	
	Tons.	Tons.	Tons.	Tons.
<i>Total supplies —</i>				
<i>Wheat —</i>				
Production estimated ..	9,725,000		9,435,000	
Imports by sea	7,433		13,066	
Imports by rail (through land frontier routes) ..	6,485		8,564	
<i>Flour —</i>				
Imports by sea (converted into wheat at 70 per cent.)	240		524	
Biscuits and Cakes (Flour content)	700		700	
	<hr/> 9,739,858		<hr/> 9,457,854	
<i>Deduct —</i>				
<i>Wheat —</i>				
Exports by sea	10,962		9,590	
Exports by land	33,715		27,666	
<i>Flour —</i>				
Exports by sea (converted into wheat at 70 per cent.) ..	16,804		25,759	
Estimated requirements for seed	1,250,000		1,250,000	
	<hr/> 1,311,481		<hr/> 1,313,015	
	<hr/>		<hr/>	
Balance available for consumption	8,428,377		8,144,839	

INTER-CHAPTER ONE.

At present India grows less than one acre of wheat for every ten persons. Canada and Australia, on the other hand, have two to two and a half acres for each member of the population. Continental countries, *e.g.*, France and Italy have one acre of wheat for every three persons, and the United Kingdom one for four.

A sum of Rs. 64½ crores represents the total hypothetical value of the Indian wheat crop based on last year's production and on up-country prices of, say, Rs. 2-8-0 per maund. The average area under wheat during the last five years is 34.4 million acres, and the production 9.5 million tons. One fourth of the acreage is in Indian States, chiefly Central India.

Wheat growing is mainly concentrated in the northern part of the country. For example, the Punjab, the United Provinces and the Central Provinces contain more than 80 per cent. of the acreage in British India. The wheat area as a whole is increasing slowly, but even allowing for a fairly rapid expansion in Sind, the additional acreage sown with wheat during the next five years is not likely to exceed 3 per cent.

The methods of estimating the yield per acre and total production leave much to be desired. In spite of increased areas under irrigation, for example, and the planting of 6½ million acres with improved varieties, the estimated average yield per acre shows no increase in recent years. There is, it seems, a general tendency to under-estimate the production. The recently appointed Wheat Committee of the Imperial Council of Agricultural Research has, however, taken up this question.

Although wheat is an important cash crop, almost half the produce is retained by the cultivators and

villagers. Growers part with large quantities of wheat in the way of barter and payments in kind for harvest wages, rents, village *mamools* (customary payments), etc. The existence of this system makes it difficult for growers to derive full benefit from favourable prices. All these barter arrangements tend to retard the development of marketing and the bearing of this question not only on marketing but also on agricultural indebtedness and high rates of interest seems worth considering.

The supplies of wheat actually put on the market show a very wide fluctuation in the course of the season. Between 50 and 60 per cent. is sold in the months immediately following harvest. Later, during the monsoon, supplies fall off and business is practically at a standstill in many upcountry markets. As will appear in subsequent chapters this gives rise to a serious depression in prices at harvest time and raises problems connected with storage and also with transport and communications.

Before discussing the marketing of wheat it is necessary to pause and ask "What is wheat?" The answer is not easy. Two main sub-species are grown in India, viz., *Triticum vulgare* and *Triticum durum* with a sprinkling of others such as the *Emmer* wheats. These differ very widely in their botanical and commercial characteristics; some on account of their quality command a high premium and others sell at a discount. There is a confusing multiplicity of trade names and descriptions of wheat throughout India so that buyers and sellers using the same term may often mean something entirely different. The more generally understood descriptions perhaps are "*sharbati*" for hard, white wheat and "*pissi*" for soft white (*Triticum vulgare*): "*dara*" approximates to "fair average quality" in different districts, and "*bansi*", "*jalalia*" and "*khandwa*" refer to different types of *durum*.

Quite evidently the existing confusion of terms must be cleared up to bring about comparable quotations and cohesion in the internal market. The terms at present in use seem more suitable for the Tower of Babel than a market.

Turning to the question of wheat imports it will be observed that these now amount to very little and only partly offset the exports. For example, during the ten years ending 1929-30 imports represented only about half the exports. Australia provides nearly all the imported supplies and there is naturally an incentive to import when Indian prices are sufficiently high to make it worth while.

The exports of wheat mainly to the United Kingdom, have always been irregular and the average in recent years has been small. During the last five years there have been no exports at all to Continental Europe. Exports of the 1936 crop up to the end of December have almost touched the 200,000 ton mark and are likely to go higher. This is commonly understood to be due to the rising level of world prices. To some extent this is true but the deciding factor appears to be the margin in India between the price of wheat and the prices of the other important *rabi* food crops, such as gram and barley. When these are relatively cheap large quantities are consumed in preference to wheat which is then available for export and *vice versa*.

The overseas trade in wheat-flour and other wheat products is comparatively small. Imports of flour are almost negligible. Exports are now down to about 12,000 tons which is only a fourth of the exports five years ago. Imports of biscuits and cakes during the past year amounted to about Rs. 36 lakhs and Burma appears to take over 40 per cent. of the total quantity imported.

The net supply of wheat and wheat products available for consumption in India, apart from seed, is from 8 million to 8½ million tons. Of this approximately 3 million tons is retained by cultivators and in the villages in the producing areas.

The remainder of this report deals with the marketing of the balance of the crop amounting to about 5 million tons.

CHAPTER II.—UTILISATION AND DEMAND.

A.—Utilisation.

(1) GENERAL.

Owing to the absence of statistical data it is very difficult to arrive at the details regarding the utilisation of wheat and the quantity in demand for various purposes. The estimates which follow are based on facts as ascertained by personal contact between Marketing staffs, producers, processors, merchants and consumers. The enquiry was fairly extensive but having regard to the quantities involved there is a possibility of the estimates being subject to a fair margin of error and the figures as given must be regarded as a rough approximation only. In particular, the estimates do not take into consideration any loss or wastage in storage, etc.

(a) *Disappearance and per capita consumption in different districts.*—It has already been observed that the consumption of wheat varies according to its relative value as compared with other *rabi* food crops particularly barley and gram. From Bengal, where rice is the staple food, it is also reported that wheat growers retain a larger proportion for their own use if they are able to obtain a good price for their rice crop. There is at the same time a large difference in the rate of consumption of wheat in urban and rural areas. For example, in Delhi a survey showed that the consumption per head was fairly high, being over 250 lb. per annum owing to the fact that 70 per cent. of the population are to be found in the urban area. In the city the rate was about 320 lb. per annum and in the rural areas between 95 and 100 lb. per head. Further between one district and another in the same province there are wide differences in the rate of consumption. It will be appreciated therefore that the *per capita* consumption* in any province or State (see Appendix XIV) is no index to the general character of the diet or utilisation throughout the area as a whole.

In the Punjab gram and barley—and maize also in the north-western districts—constitute an important part of the diet, particularly of the rural population. Taking as a basis the net supplies, the disappearance in the Punjab may be estimated as somewhere in the neighbourhood of 200 to 210 lb. *per capita*. In Sind, including Khairpur State, the annual disappearance is 72 lb. per head which is accounted for by the predominance of other foodgrains such as *bajri* and *juar*. In the North-West Frontier Province, on the other hand, the rate rises to about 220 lb. per head.

In Patiala State, which lies to the east and within the borders of the Punjab, a survey showed that the annual consumption in the State territory is only about 60 lb. per head. This is apparently due to the fact that maize forms a fairly large proportion of the diet particularly in the hilly tracts of the State.

*Based on net available supplies after allowing for exports and imports and deducting local seed requirements but making no allowance for loss or wastage in storage, etc.

In the United Provinces a survey of 13 cities and towns* showed a *per capita* consumption of 260 lb. per annum. Several of these towns, however, have large cantonments quartering European troops. Owing to the fact that there is no record of the quantity arriving and leaving the provinces by road, there is an unknown error in the estimated net available supplies as calculated by taking local production and the rail movements alone. On this latter basis, however, the annual disappearance for the whole province works out at about 100 lb. *per capita*. In Gwalior, a large State adjoining the southern borders of the United Provinces, the rate of disappearance is about 130 lb.

In the Central Provinces the *per capita* disappearance based on the estimated net available supplies is reckoned at about 70 lb. per annum, but this varies considerably in different parts of the province. In the Nerbada block for example, where wheat is the main crop, the consumption is estimated to be as high as 240 lb. but in the east, where rice is the staple food, the figure falls to about 20 lb. In the west of the province although *juar* is the staple food the tract is more prosperous generally and the rate of consumption for wheat rises to about 12 lb. per annum.

In Bihar and Orissa the annual rate of consumption falls to about 30 lb. per head and further east towards Bengal to about 12 lb. In Burma the rate becomes very low and does not appear to exceed 5 or 6 lb. per head while in Assam it is only 4 lb.

In Rajputana the annual rate of consumption is about 65 lb. while in the Central India States as a whole the rate of disappearance is a little more than 70 lb. per head. In Baroda State the consumption *per capita* is no more than 30 lb. per head.

Further south the rate of consumption decreases. In Hyderabad, for example, the annual disappearance is less than 20 lb. In Madras the local absorption of wheat, and wheat products in terms of wheat, does not exceed about 80,000 tons. This is mainly in the cities and towns. Reckoned on the basis of the presidency population this works out at only about 4 lb. per head. It should, however, be noted that the use of wheat and wheat products is steadily on the increase in Southern India. In Cochin, for example, during the past 5 years imports of wheat have increased by 50 per cent., and imports of wheat products have been almost doubled, so that in 1934-35 the consumption was 5 lb. per head. For India as a whole, in 1934-35 allowing an increase of 1 per cent. per annum in the population since the 1931 census the average consumption per head works out at about 52 lb. This is practically the same as the estimated rate of consumption in 1920-21 based on the average net available supplies of the previous five years but omitting the very bad crop of 1920-21. In Southern India there is evidence that the consumption of wheat is increasing but so far as statistics go there is nothing to indicate that the rate of consumption per head in India as a whole is either increasing or decreasing.

(b) *Export demand*.—Although there is a potential demand for Indian wheat on the world markets the exports are very irregular.

*Meerut, Najibabad, Chandpur, Dhampur, Bareilly, Shahjahanpur, Aligarh, Muttra, Jhansi, Allahabad, Barabanki, Benares and Fyzabad.

It has already been pointed out that the demand for export becomes effective only when the price of competing wheats on the United Kingdom markets is sufficiently above local Karachi prices to warrant exports and when the prices of other food stuffs on the Indian market, particularly barley and gram, are relatively low as compared with wheat in which case the ryot is apparently prepared to release wheat for export.

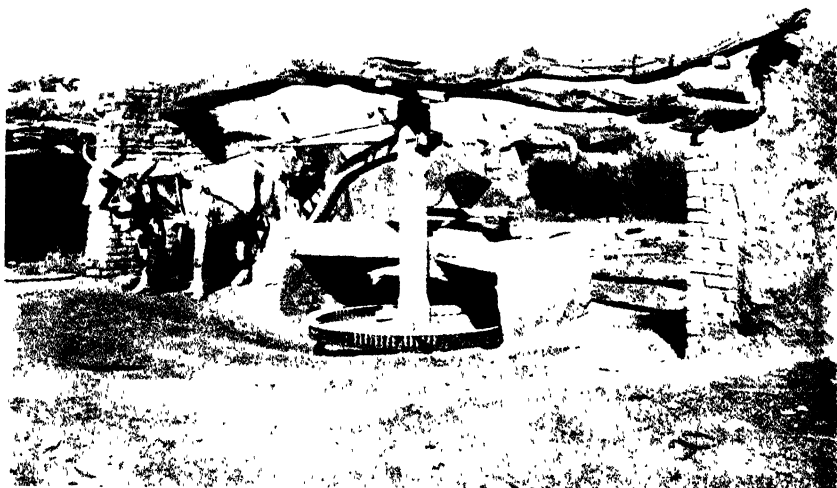
(2) FOR VARIOUS PURPOSES.

Wheat is purchased by householders direct for grinding by hand *chakki* and consumption in the home. They also buy wheat and have it ground in power *chakkis*. In urban districts hand *chakkis* are not now as numerous as formerly but outside the cities and larger towns the grinding of wheat by hand *chakkis* is still common. The wheat, acquired either by purchase, or drawn from domestic stocks if on the farm, is ground by the women of the household, and where *suji* is required the flour is sifted through a fine cloth, usually muslin, stretched over the mouth of a basket. The *suji* obtained in this way does not amount to more than 5 or 6 per cent. To a small extent owners of urban power driven *chakkis* grind *ata* for sale in the bazaar and to *halwais* and bazaar food shops. *Chakki* owners seldom maintain any written records so that it is difficult to get figures over any reasonable period for the amount of wheat and other products utilised in this way or for domestic consumption.

The large modern roller mills produce different types of wheat products for sale to bakeries, retailers, etc. Even in regard to the output of roller mills the statistics leave much to be desired. No systematic figures have been collected in regard to the number or output of *chakkis* apart from what has been done in the course of this survey. Having regard to the large quantities which go into domestic consumption either direct or after grinding in power driven *chakkis*, it will be appreciated that a really accurate estimate of the quantity used in each case is not possible in the absence of a complete census of production.

(a) *Domestic use (direct).*—In those parts of India where wheat forms an important constituent of the diet of the people it is mainly used in the form of *chapatis* and *parathas* (*chapati* cooked in *ghi*). *Puris* and *kachauris* (*kacheris*) are other popular wheat preparations which are very frequently taken on ceremonial or special occasions. In Southern India, however, the common wheat preparation is *uppumav* (a form of semolina pudding) and a similar product *rabri* is used in Rajputana and Central India. A number of other products such as sweetmeats (*halwa*, *kesari*, etc.), and *sewayan* (a fine vermicelli) are made.

For making *chapatis*, *parathas* and *kachauris* the wheat is generally used in the form of *ata* (whole meal flour), but for *puris* and *sewayan*, *maida* (flour), is preferred although *suji* is also sometimes used in the latter preparation. *Uppumav*, as already mentioned, is made from *suji* or *rawa* (fine or coarse semolina). For the various sweetmeats both flour and semolinas are used mixed or separately. *Ata* is rarely employed for this purpose. Most of these

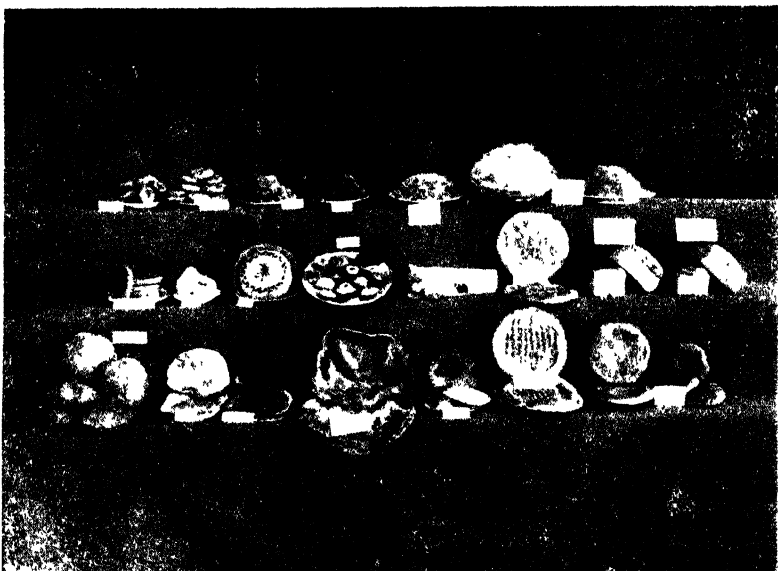


CHAKKI OR BULLOCK DRIVEN FLOUR MILL OF A TYPE
COMMONLY FOUND IN THE PUNJAB



CHAKKI (OR SMALL STONE MILL) DRIVEN BY ELECTRICITY

SOME COMMON WHEAT PREPARATIONS.



Top row from left to right :—*Khajuri, Babushahi, Halwa, Laddu, Sona, Maida sevanan.*

Middle row :—*Sohan Laddu, Pheni, Cake, Pastry, Biscuits, Maida roti, Hotel-made dabul roti, Bazaar-made dabul roti*

Last row :—*Kachauri, Puri, Paratha, Chapati (unleavened cake) Pao, Ka Van (leavened bread), Al garh biscuits*



SEWLYAN (VERMICELLI).

products as well as bread (*dabal roti*), cakes and biscuits are illustrated on plates on the opposite page.

(b) *Preparation of food products by* :—(i) *Halwais (confectioners) and bazaar food shops*.—The main wheat products produced by these agencies are sweetmeats of various kinds and *puris* and *kachauris*. Many of the sweetmeats contain a high proportion of wheat products. For example, *halwa* or *kesari*, probably the most popular Indian sweet, may contain as much as 35 per cent. of *suji*. The *halwai* is, however, distinct from the ordinary food shops* where *chapatis* and *parathas* and other edibles such as curries, etc., are prepared for consumption, usually on the premises. Taking the products of these agencies as a whole, the wheat is apparently used in the form of *ata* to the extent of 60 or 70 per cent., *maida* 20 or 30 per cent. and *suji* 10 or 15 per cent.

(ii) *Bakers and biscuit manufacturers*.—It is difficult to differentiate between these two. In the main the baker produces *dabal roti* (fermented bread in the form of loaves) and does not engage in the manufacture of *chapatis*. Even the small bazaar baker makes quite an appreciable proportion of biscuits, and the large factory bakers in the cities also make biscuits as well as bread and cakes. There are only about half a dozen specialised biscuit factories in the whole of India. As the consumption of flour by four of these concerns which furnished returns amounts on an average to about 1,500 tons annually, the total quantity of wheat flour used by such agencies is probably about 2,000 tons which is the equivalent of about 2,600 tons of wheat. For their purpose wheat is required mainly in the form of high grade flour (*maida*). A certain amount of *ata* is used in making brown bread and certain forms of biscuits (particularly dog biscuits), etc. Returns, furnished by three large bakeries, for example, give a range in the consumption of *ata* of from 9 to 12 per cent. of their total consumption of wheat products.

(c) *Industrial (sizing starch)*.—So far as could be ascertained in the course of the survey the consumption of wheat flour in the form of starch for sizing purposes by 57 cotton mills—including most of the largest concerns in the country—shows that approximately 6,600 tons of wheat flour were used in their size mixing in 1935. 43 mills appeared to use no wheat flour at all and information was lacking from a certain number of other mills which made no returns. It is estimated that on the whole somewhere between 7,000 and 8,000 tons of wheat flour are used annually by the textile industry in India. The proportion of wheat flour in the size ranges from $1\frac{1}{2}$ to 50 per cent. in some cases.

(d) *Stock feeding*.—As has already been stated, the amount of wheat actually used for feeding to poultry, cattle, etc., is almost negligible. In the larger towns poultry are often fed on the screenings of wheat which consist mainly of thin shrivelled grains, as well as admixtures of other non-descript grain and weed seeds. It is not possible to estimate accurately the quantity of wheat products used for this purpose. A certain amount of bran† is sifted out

*Vernacular—*Dhaba, loh, tanur, nanbai ki dukan.*

†Vernacular—*Chokar.*

after crushing in hand mills and *chakkis*, but the practice is not general and the quantities are relatively small, say about 2 per cent. at the most. The output of bran by the large roller mills amounts on an average to more than 150,000 tons per annum which is apparently consumed partly by cows and buffaloes kept in the large towns and cities, where the roller mills are localised, and partly by tonga ponies, etc. At least 30 per cent. of the total output is consumed by horses in cantonment areas throughout India.

(e) *Seed*.—The average seed rate, allowing for resowings, is estimated at about one maund (82.2½ lb.) roughly, per acre, although considerable variations occur in different areas (see Chapter XI). At this rate the seed required for sowing 34.4 million acres, i.e., the average area during the last 5 years, is over 1.25 million tons.

Apart from exceptional cases, e.g., earthquake, flood or famine conditions, there is apparently no demand for any particular type of seed outside the area where it is grown. In the case of certain improved varieties, however, there is a small demand, mainly on the part of Agricultural Departments, with a view to extending the area under improved types. This is, however, dealt with in a later chapter.

B.—Demand.

The wheat retained in the cultivator's village in the wheat growing areas, apart from seed, is roughly 3 million tons which is used for payments in kind, barter and consumption by cultivators, etc. This amount cannot be regarded as constituting any part of the effective market demand. Indeed, as already observed, it forms in some measure a reserve supply which the ryot is prepared to market if the prices of other food stuffs are low. In regard to the remaining 5 million tons actually marketed, the consumers' demand is directed through 3 main channels or agencies.

(1) QUANTITATIVE REQUIREMENTS.

(a) *For domestic use (direct)*.—The amount of wheat purchased from local merchants and ground in hand *chakkis* in the household is now very small so far as the large cities in Northern India are concerned. In Southern and Central India generally and especially among the Marwari and Gujerati communities the practice is more common—even in the cities. In the rural areas throughout India apart from some water, bullock or camel driven *chakkis* (see plate facing page 60) and a few power oil *chakkis* in the villages, grinding by hand by the women of the household remains the customary practice. It is difficult to calculate the total requirements for this purpose. An estimate arrived at largely by eliminating other factors places the amount purchased direct for domestic use at somewhere in the neighbourhood of 2½ million tons.

(b) *For crushing in power driven chakkis*.—In the cities and all the larger towns there are numerous small stone mills (*chakkis*) driven usually by electricity or oil, the latter predominate in the rural areas (see plate facing page 60). These are engaged not only in crushing wheat but also barley, maize, gram, other pulses, spices, etc. Their average capacity ranges from about 40 to 50

maunds per day of which probably about one-third may be taken to represent wheat. On this basis each *chakki* appears to crush 150 to 190 tons of wheat a year. Occasionally, certain *chakki* owners buy wheat on their own account which they convert into *ata* mostly for sale in their own shops. Generally, however, they grind wheat for customers who buy wheat from them or from other merchants in the bazaar. The quantities are small, usually 10 to 15 seers at a time, and the charge made for crushing normally ranges from 2 to 4 annas per maund. Details are more fully dealt with in a later chapter on "Processing".

Here also there is difficulty in arriving at an accurate estimate of the total quantity involved in the whole of India since no precise data regarding the capacity, hours of working and proportion of commodities handled by *chakkis* are available. In the course of this survey, however, figures were obtained in regard to the number of *chakkis*, mainly from oil distributing and electric supply companies, etc. On this basis the quantity of wheat estimated to be crushed in this way in various provinces and States amounts to about 2½ million tons (*see* page 295).

It is important to observe that these stone *chakkis* are not equipped to produce fine flour (*maida*) and that they only produce *ata* (whole meal flour) which may on occasion be roughly sifted to remove a small percentage of the bran. No instance was found during the course of the survey in which *chakkis* were used to produce *suji* (semolina) although they appear perfectly capable of so doing by the addition of some simple screening device which they at present lack.

(c) *For grinding in roller mills.*—According to the latest available information there are 80 roller mills in India. The majority of these are equipped for turning out a complete range of products, *viz.*, *maida*, *ata*, *suji*, *rava* and bran. The Director-General, Commercial Intelligence and Statistics, publishes a monthly statement showing the output of flour mills in India. Unfortunately, however, the figures are incomplete and refer only to 25 of the larger mills which voluntarily provide returns. In arriving at the total wheat requirements of the roller mills a further difficulty arises in that several of them mill other grains apart from wheat and a variable number are closed from time to time. The capacity of these mills varies from 20 to 210 maunds of wheat per hour, but the average is about 130 maunds.

From Appendix XV it appears that the total wheat requirements of all the roller mills in different provinces and States throughout India is about 1 million tons per annum. Of this approximately two-fifths are converted into *maida* and about one-third into *ata*. *Suji* represents one-twelfth of the output and bran about one-sixth.

In effect only the roller mills are in a position to meet the consumers' demand for *maida* throughout India which is apparently somewhere in the neighbourhood of 400,000 tons. They also provide more than 70,000 tons of the *suji* requirements of the country.

The roller mills are also almost the only source of bran for stock feeding and of *maida* for use as starch in sizing textile fabrics.

Unfortunately in respect of this last category their output cannot be taken as an index of the demand. The figures of production by certain mills of the Calcutta Flour Mills Association, for example, show that the local industry has lost a great deal of the trade in this direction although imports of starch, farina, sago and other sizing materials have considerably increased, particularly into Bombay Presidency where the cotton textile mills are mainly located.

The output of *maida* for use as starch in the flour mills referred to has decreased from 3,800 tons in 1924 to 575 tons in 1935. The imports, however, of starch and farina into India, as will be seen from the following table, rose from about 8,509 tons in 1926-27 to 15,990 tons in 1934-35. During the quinquennium 1931-32|1935-36 the imports increased by 33 per cent. and the rise is particularly noticeable in the case of starch which rose from about 7,100 tons to over 11,500 tons in 1934-35.

Imports of starch, etc.
(Tons.)

Year.					Starch.	Farina.	Sago flour*.
1926-27	..	..	..	..	4,777	3,732	..
1927-28	..	..	..	..	12,837	3,587	..
1928-29	..	..	..	..	10,819	2,157	..
1929-30	..	..	..	..	9,551	3,438	8,806
1930-31	..	..	..	..	7,015	4,260	10,629
1931-32	..	..	..	..	7,108	5,543	11,995
1932-33	..	..	..	..	7,085	4,580	13,445
1933-34	..	..	..	..	9,000	4,142	13,566
1934-35	..	..	..	..	11,522	4,468	12,646
1935-36	..	..	..	..	32,872†	..	..

(2) QUALITY REQUIREMENTS.

(a) *Wheat*.—"Strong" white wheat.—This is in demand for all *ata* for domestic use or for the preparations made by *halwais* and bazaar food shops. It is also sought after by the roller mills for the production of *maida* for use in baking *dabal roti* and it constitutes in large measure the source of their output of *suji*.

*Separately recorded only from 1929-30.

†All starches. Detailed figures are not yet available.

“ *Soft* ” *white wheat*.—This is sometimes preferred for domestic use, partly on account of its colour and partly owing to the fact that it is easier to grind in the hand *chakki*. Its use in this way is, however, mainly confined to those districts where it is grown. There is a tendency, in fact, for all types of wheats to be used, regardless of their quality, for all purposes in the districts where they are grown.

Red wheats (T. vulgare).—The consumption of this is also largely confined to the districts where it is grown. Throughout the Rajputana States and Baroda red wheat *ata* is given preference to that made from white wheat. It is claimed that the *chapatis* made from this *ata* are sweeter and keep soft for a longer time. It is perhaps significant that the common practice is to mix gram *ata* with red wheat *ata* in areas where red wheat is cheaper than white. Red wheat grown in the Punjab sells there at a discount of 1 to 2 annas per maund as compared with the local white varieties. These selfsame red wheats when imported, say, into Alwar in Rajputana command a premium of Re. 0-1-0 to Re. 0-2-0, more per maund over white wheat grown and imported from the identical source. There seems, however, to be a change setting in and there is some evidence that red wheat from the Punjab is being replaced by *sharbatu*.

Durum wheats.—The hard nature of these makes them suitable for the preparation of *suji* for use in the manufacture of *halwa*, *sewayan*, for making the *uppumav* of Southern India and *rabri* (a boiled preparation of *suji* usually eaten with milk or butter-milk flavoured with salt) in Rajputana and adjacent tracts in Central India.

Although mills and shippers' buying contracts in Sind exclude any but a small percentage of *kony* it is however preferred by the sweetmeat manufacturer. Emmer wheat (*khapli*), a product of South India, is also similarly favoured for the preparation of *suji*.

It may be observed, however, that owing to the wear and tear on the rollers *durum* wheats are disliked by roller mills. The electric power used in power driven *chakkis* for grinding one maund of wheat is about 1.3 units for very soft wheats and 1.6 or 1.7 in the case of *durum*. As far as could be ascertained power driven *chakkis* do not turn out *suji*, for which *durum* is particularly suited, and the manufacture of this product from *durum* wheats, therefore, appears to be left still entirely to the hand *chakki*.

Durum wheat is very popular with the Marwari and Gujarati communities in the Peninsula for conversion into *ata* and high prices are paid for such wheats (*see later*). But in addition to the particular demand for this type of consumer a large proportion of the *durums* grown in Bombay and the Deccan generally are consumed in the areas in which they are produced, in the form of *ata*. In Madras *durum* wheat is mainly converted into *suji* in the household.

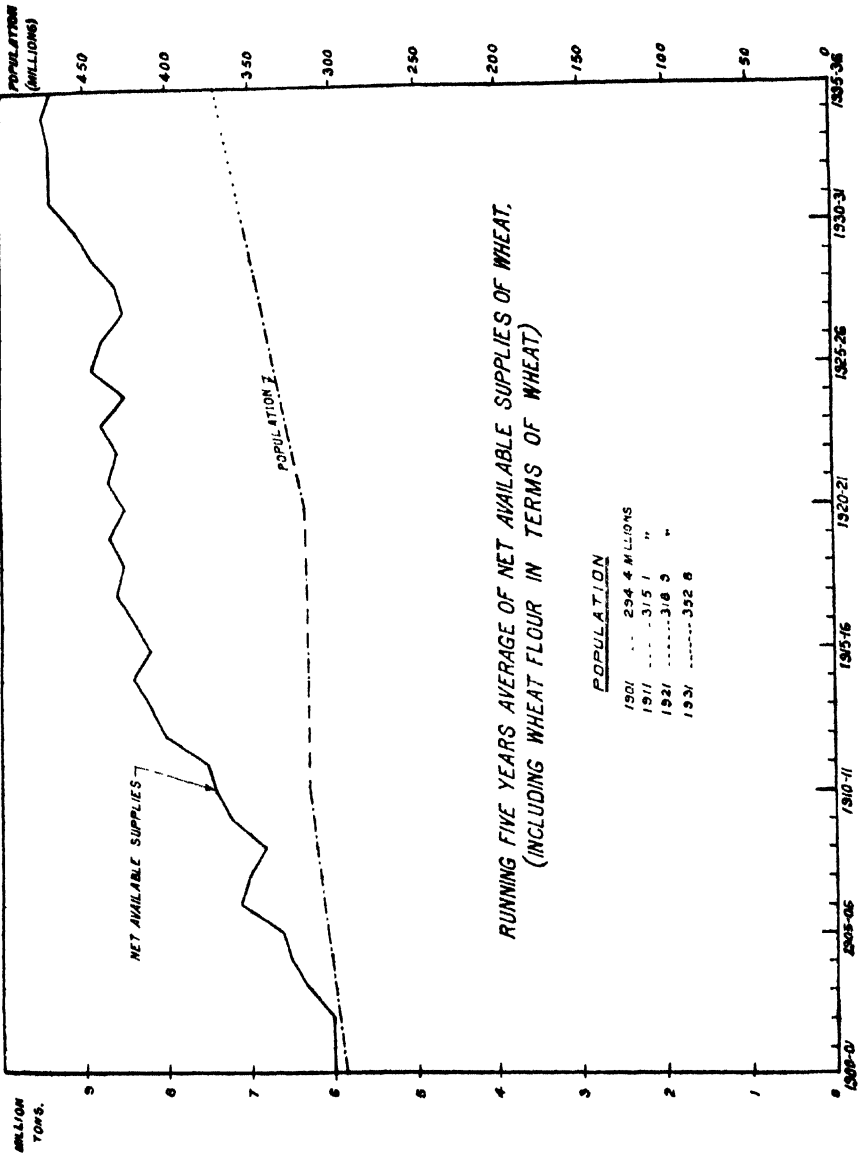
(b) *Wheat products*.—Since such a large proportion of the wheat in India is turned into *ata* for making *chapatis* the quality

of wheat must therefore be judged chiefly from this point of view. A good *chapati* should not be dark in colour. *Ata* made from red wheat is on that account regarded as undesirable in most parts. The dough for making a *chapati* should be elastic, the more elastic the better, and the wheat should for choice have a high gluten content. In its final form the *chapati* should be fairly thin and the more *chapatis* that can be made from a given quantity of *ata* the better the wheat.

Although *chapatis* are usually—and preferably—consumed directly after baking, they may have to be kept for some time before eating, e.g., by those whose work takes them some distance from their homes. *Chapatis* have to be retained for a time also in the bazar food shops pending sale. Therefore, a *chapati* made from a “strong” *ata* which retains moisture better and for longer periods than one made from “weak” is to be preferred. This is the most important characteristic of a good *chapati* and is regarded by many to outweigh any other factor. For domestic use or for quick sale in the bazaar foodshop *chapatis* made from soft or mixed white wheat *ata* are quite suitable, but discriminating buyers prefer *ata* made from a “strong” *sharbat* type of wheat.

Several experiments were made in Delhi to find out the *chapati* yield per seer of *ata* prepared from hard and soft wheats of the *T. durum* and *T. vulgare* species (Appendix XVI). The number of *chapatis* obtainable is mainly influenced by the amount of water absorbed and retained by the different types of *ata*. In this respect comparison between *atas* made from hard *sharbat* wheat (*T. vulgare*) and soft non-descript white wheat grown in Northern India showed that the former was better and absorbed 40.6 per cent. of water whereas that made from ordinary white wheat containing less gluten absorbed only 21.8 per cent. The number of *chapatis* weighing 4 tolas each which could be obtained from a seer of these *atas* was, therefore, 28 and 24½ respectively. Taking price into consideration the *ata* cost per *chapati* prepared from *sharbat* was 0.62 pies and in the case of the softer wheat 0.65 pies, so that the more expensive wheat turned out in the end to be the cheaper. *Ata* prepared from *durum* wheats such as *bakhshi*, *Bijapur* red and *khapli* (*Emmer*) also revealed a marked superiority over the *vulgare* types grown in the Punjab although the differences are not so noteworthy when compared with really high quality selected *sharbatis* and *pissis*.

In the manufacture of *sewayan* and sweetmeats such as *halwa* or *kesari*, *maida* and *suji* made from hard wheat are preferred. For making *dabal roti*, *maida* made from a mixture of hard and soft wheats containing 60—75 per cent. hard is most suitable, but the gluten of very hard *durum* type of wheat requires a longer time to modify in the process of fermentation and is generally unsuitable for this purpose, except possibly in very small quantities. Since wheat exported to Europe is mainly used in the manufacture of fermented bread the same quality characteristics apply.



For biscuits and cakes the softer the wheat the better, and for *maida* to be used as starch by the textile industry it would appear that soft starchy wheat is to be preferred.

(3) PERIODICITY.

Important religious festivals such as Dusehra, Shab-i-barat and Diwali stimulate the consumption of wheat particularly in the form of luxuries such as sweetmeats and other confections, etc. The general tendency appears to be for consumption to rise during the winter months. More wheat flour, for example, is moved by rail between October and March than in the other six months as will be seen from the table below. The monthly movement by rail of wheat flour gives a fair indication of the seasonal variation in demand and is illustrated in the diagram on page 69. From this and the following table, it will be seen that the movement is at its lowest during the hot weather in June and at its highest in October which is not only the beginning of the winter season but also the occasion of several prominent festivals.

*Movement of wheat flour by rail.** (Thousand tons.)

Months.	1933-34.	1934-35.	1935-36.
April	10·7	16·3	16·0
May	12·4	16·0	16·4
June	12·0	14·4	14·6
July	12·6	16·5	18·2
August	15·8	20·7	19·0
September ..	17·1	19·2	21·0
Total for six months	80·6	103·1	105·2
October	17·1	22·6	24·9
November ..	17·8	21·4	17·2
December ..	15·7	18·1	16·4
January	17·8	20·4	18·0
February ..	18·7	16·6	19·1
March	17·4	17·0	20·2
Total for six months	104·5	116·1	115·8
GRAND TOTAL ..	185·1	219·2	221

*Accounts relating to the Inland (Rail and Riverborne) Trade of India.

This is further confirmed by the fact that the monthly output of wheat products of the 25 roller mills submitting regular returns to the Director-General, Commercial Intelligence and Statistics, is at its highest during the months of August, September and October. The average output during these three months represents about 27 per cent. of the total annual production. In the following three months, November to January, the output represents 24.9 per cent. of the total. (See the diagram on page 69 and Appendix V.)

(4) TREND.

The demand for wheat in India seems to be slowly but steadily increasing due mainly to the expansion in population (see the diagram on page 67). An increasing rate of *per capita* consumption is observed in Southern India which depends largely on supplies from other districts. During the last five years, for example, the imports of wheat and wheat flour into Madras by sea increased from 36,000 tons to 47,000 tons, that is, by more than 30 per cent. Unfortunately the imports by rail which amounted, on an average, to about 27,000 tons during the last 3 years are not available for the full 5 years period, but enquiries from the trade show that there has not been any appreciable change in the rail traffic. The increasing imports into Mysore from Central India are also worth noticing. In 1919-20 there were no exports from Central India to Mysore, but in 1933-34 the trade had developed to the extent of 5,660 tons, and in the two succeeding years to 6,200 and 7,450 tons respectively. Mysore's rail-borne imports from all sources have, since 1919-20 risen from about 1,450 tons to 14,300 tons. The imports of wheat into Travancore within the last 5 years, although small, have practically doubled themselves and in the case of Cochin, imports by sea have steadily risen during the same period from 5,804 tons to 9,350 tons.

Apart from this recent trend of wheat consumption the most notable fact of importance is the increasing tendency for wheat to be milled in power driven *chakkis* instead of in the hand *chakki* at home.

This development has been largely a feature of post-war India and now, as already stated, 2½ million tons are estimated to be crushed in this way. Returns received from the electric supply companies throughout India show that the number of electrically driven *chakkis* has increased from 1,200 to nearly 3,000 in the last five years. Even assuming that the hand *chakki* continues to be used for crushing the 3 million tons estimated to be retained in the cultivators' villages, there remains another 2 million tons which are still being crushed by the hand *chakki*. If the present rate of progress continues there is apparently a possibility of establishing another 10,000 power driven *chakkis* within the next few years to deal with the 2 million tons referred to.

INTER-CHAPTER TWO.

UTILIZATION AND DEMAND.

The consumption of wheat is apparently as high as 350 lb. or more per head a year in some of the cities in Northern India. Towards the east in Assam, and the south in Madras Presidency, the *per capita* consumption is as low as 4 lb. per year.

So far as utilisation is concerned, the statistical position leaves much to be desired. Twenty-five of the larger roller mills in India make regular returns of their output to the Director-General, Commercial Intelligence and Statistics, but apart from these there are no official records. It has already been observed that out of a total production of about $9\frac{1}{2}$ million tons, after allowing for seed retained by the cultivators, roughly 3 million tons are disposed of locally in the villages by way of payment in kind, barter, etc. This leaves something like 5 million tons actually put on the market. Of this amount it appears that 2 million tons are crushed for domestic use in hand *chakkis*—mainly in the smaller towns and villages. Over 2 million tons is converted into *ata* in urban power-driven *chakkis* and only 1 million tons is dealt with in all the roller mills. The amount of wheat used for stock-feeding is practically negligible but about 150,000 tons of bran produced by the roller mills, along with a little—at most 2 per cent.—obtained by sifting the product milled by *chakkis*, is used for stock feeding. At least 30 per cent. of the bran produced by roller mills is consumed by horses in cantonment areas.

A certain amount of fermented bread in the form of loaves (*dabal roti*) is produced by bazaar bakers and by the large bakeries and restaurants in the cities, and there are also about half a dozen biscuit factories in India but the fact remains that the amount of wheat

utilised in this way forms only a very small proportion of the total. The big bulk of the wheat is undoubtedly converted into *chapatis* and *parathas* or *puris* (*chapatis* cooked in ghee). For making *chapatis* a hard, strong wheat of the *sharbati* type with plenty of gluten is required, and discriminating buyers, even amongst the poorer classes, are prepared to pay a premium for this type of wheat. This is apparently justified, for baking experiments which have been carried out show that from one seer of *ata* made from *sharbati* 28 *chapatis* weighing 4 tolas each could be obtained at a cost of 0.62 pies per *chapati*, as compared with 24½ *chapatis* costing 0.65 pies each, even after paying a premium of 2 annas 6 pies per maund for *sharbati* wheat.

Ata (whole-meal) is the main product made from wheat. In the case of the roller mills the *ata* amounts only to about 34 per cent. but the whole of the output of power driven *chakkis* consists of *ata* and in the case of the hand *chakki* although *ata* is the main product there is a certain amount of *suji* (coarse semolina) sifted out especially in Southern India. The amount of *maida* (white starchy flour derived from the centre of the grain) is about 400,000 tons. This is all produced in the roller mills. *Ata* to be in its best condition must be freshly ground before use and this is in fact the custom whether it is ground by hand *chakki* or in power driven *chakkis*. In some respects consumers in India are fortunate in their present habits. According to McCarrison, for instance, whole-meal flour (*ata*) contains Vitamin A and is rich in Vitamin B, whereas at most white flour has only a very little Vitamin B. The protein content of *ata* is also higher and of better quality than that of white flour.

Although the consumption of wheat as a whole appears to be increasing, there is no indication that the

consumption of *maida* (white flour) is increasing to the same extent. In fact, the roller mills which produce *maida* apparently find it difficult to carry on and quite a number of them have shut down recently. On the other hand the number of power *chakkis* seems to be increasing very rapidly. Returns from electric supply companies indicate that the number of *chakkis* operated by electric power has more than doubled within the past 5 years. At this rate within a very short time it is possible that the 2½ million tons at present crushed by hand *chakkis*—apart from the 3 million tons retained in the village—may be dealt with in power driven *chakkis* (either oil or electric). This would apparently provide occupation for another 20,000 to 30,000 persons with a total income of about 20 lakhs per month.

Next to *ata*, *suji* (coarse semolina) and *rawa* (fine semolina), but mainly *suji*, are the most important. *Suji* represents 5 to 15 per cent. of the requirements of the *halwais* and bazaar food shops in Northern India and the output of *suji* from roller mills amounts to about 71,000 tons or 8 per cent. Approximately the same quantity especially of coarse roughly ground wheat, preferably of the *durum* type, appears to be made in the hand *chakkis* of Central and Southern India. *Suji* is used for *sewayan* (vermicelli), sweetmeats, *halwa*, *kesari*, etc., and in its coarser form for the preparation of boiled products such as *uppumav* and *rabri* which are favourite dishes in Southern and Central India. In Coorg, for example, more than 30 per cent. of the imports of wheat products represent *suji* and in Travancore over 20 per cent.

The hard, *durum* wheats, met with mainly in Central India and in the south, are eminently suitable for the manufacture of these products. It appears, however, that owing to the wear and tear on their rollers the owners of roller mills do not like to use *durum* wheats,

and the power driven stone *chakkis* are not at present suitably equipped for separating the *suji* from the remainder of the flour. It would seem desirable to design some simple improved form of separating equipment for use with the power driven *chakkis* if the demand for high quality hard *durum* wheats is to be maintained or increased.

There appears to be a general tendency for wheat grown in any particular district to be used for all purposes irrespective of its quality characteristics. On that account a large amount of soft white wheats are still used but outside their own districts they are not much in demand. For the manufacture of *maida* to be used in the production of fermented bread (*dabai roti*) a certain proportion of soft-wheats, from 25 to 40 per cent. is desirable in the mixture. For the manufacture of biscuits and cakes also soft wheat is to be preferred, but the demand for this is relatively small. Outside Rajputana and Baroda there appears to be no special demand for soft red wheats and even there a tendency to change over to the *sharbati* type of wheat is already noticeable.

For industrial purposes in the manufacture of starch for sizing in textile mills, a soft white starchy wheat is probably to be preferred. Unfortunately it appears that the production of wheat starch in India for this purpose is decreasing. Imported starches, *e.g.*, farina, sago flour and starch, have, however, increased to the extent of not less than 22 per cent. in the last 5 years so that out of a total amount of more than 40,000 tons of sizing starches used by the textile mills in India, less than one-fifth is at present provided by Indian millers.

CHAPTER III—WHOLESALE PRICES.

An analysis of prices is not easy. It was found, for example, that in more than one province the official or gazette prices bore little or no relation to the rates obtained from the trade direct. For a proper comparison of prices it is essential that an article be of the same quality in each case, and the general absence of a uniform standard of quality further complicates the appraisal of the available data. Wherever organised grain exchanges exist as at Karachi, Bombay, Calcutta and at certain markets in the Punjab and the United Provinces, prices have been collected from the trade direct and have been utilised, as far as possible, in this report in preference to official data. The prices of wheat at Karachi, based on the records of the local Chamber of Commerce, have been taken as the best index of Indian export values for the purpose of comparing Indian and world prices.

A.—Comparison of Indian and world prices.

For a commodity such as wheat which is widely produced and consumed throughout the whole world, there should, in theory, be a "world price" to which the prices of wheat everywhere should be related after allowing for differences in quality, transport costs and the time factor. This is, in fact, not the case. Many countries which normally have an import or an export surplus have taken certain measures to control prices, by means of tariffs, quotas, etc. The methods differ in the exporting and importing countries. The general result, however, is to bring about a very wide divergence in the prices of wheat particularly between exporting and importing countries. The following table shows the price of wheat in cents per bushel in 9 countries in January 1936, the four on the left hand column being exporting and the five on the right normally importing countries.

Prices of wheat in certain countries.*

Countries.	Cents per bushel.	Countries.	Cents per bushel.
Argentina	93	France	155
Australia	99	Austria	185
Canada	101	Czechoslovakia	197
United States	106	Germany	229
		Italy	247

In the comparison which follows, therefore, the price of Indian wheat has been compared mainly with prices in exporting countries and also with Argentine and Australian wheats on the United Kingdom market.

From this standpoint it will be seen from the diagram on page 42 that, on the whole, Karachi prices follow the general trend of

*World Production and Prices, 1935-36—League of Nations.

world prices, with the exception of periods in 1920 and 1921 when abnormal war conditions had not entirely disappeared. Between 1922 and 1928 the Indian price curve was fairly consistently below those of Australia and Argentine wheats at a level which permitted export after allowing for freight, exchange and other charges incidental to shipping. From 1928 until the end of 1935 this relationship was altered and the three price curves tended not only to converge but the Indian level at Karachi on several occasions, notably in 1932-35, rose above that of Australian wheat c. i. f. London. During these years Indian wheat was seldom in parity with other world wheats and the fact is reflected in greatly diminished exports.

Owing to short crops and reduced stocks in most exporting countries in 1935 and 1936 and a consequent rise in the world price level, Indian wheat has once again moved into export parity. The widening of the gap between Indian and Australian wheat and the accompanying increase in the margin between wheat prices and those of barley and gram has led to a resumption of exports in 1936.

The trend of Indian prices and other world wheats after the collapse of world prices in 1929 and the ensuing period of depression is shown in the following table.

Average annual prices of certain wheats during the period 1930-34.*

Year.	Winnipeg.	Chicago.	Buenos Aires.	London.	Karachi.
	No. 1 Manitoba.	No. 2 Hard winter.	Barletta.	Australian.	Sind Punjab.
	(Cents per 60 lb.)		80 kg. per Hectol, Paper Pesos per quintal.	Shillings per 480 lb. (c.i.f.).	Rupces per candy (656 lb.).
				<i>Sh. d.</i>	<i>Rs. a. p.</i>
1930 ..	94.6	95.7	9.56	36 4	26 12 0
1931 ..	58.6	67.0	6.13	23 2	19 2 0
1932 ..	55.5	53.0	6.08	26 8	25 8 0
1933 ..	60.7	75.0	5.77	24 4	24 2 0
1934 ..	74.6	98.0	6.34	24 6	21 8 0
1935 ..	85.0	107.0	7.44	27 4	23 7 0
1936† ..	81.0	105.5	10.16	30 4	24 5 0
1936‡ ..	102.8	120.6	12.15	39 7	**27 8 0

It will be seen that in 1932 while No. 1 Manitoba at Winnipeg and No. 2 Hard Winter at Chicago fell to a low point by 41 and 45 per cent. respectively and Australian wheat in London lost 36 per cent. between 1930 and 1931, Indian wheat, as shown by the values ruling at Karachi, touched bottom in 1931 with a fall of only about 28 per cent. as compared with 1930. Whereas the prices

*International Review of Agriculture, Rome.

**Karachi Chamber of Commerce.

†January-June.

‡July, August and September.

of Canadian and United States wheats continued to recede, a marked improvement in Indian prices resulted between 1931 and 1932 partly owing to the exclusion of imports. Since 1933 there has been a general upward tendency in the international wheat market partly owing to the unfavourable development of the 1934 crop in America. In India, on the other hand, values declined between 1932 and 1934 but have since risen following the world markets, though not to the same extent.

Although India grows considerably more wheat than Australia or the Argentine, she has gradually taken a reduced part in the international export trade owing mainly to her expanding internal demand. As a result, therefore, Indian prices do not necessarily react to international conditions on every occasion but may at times follow quite opposite trends, and did not, as already observed, follow world prices to the bottom limit during the depression period. On the whole, it appears that the full force of the repercussions of the international markets on Indian prices has been minimised by the action of the wheat import duty and that by preserving the internal market for Indian produce, internal conditions of supply and demand have acquired a greater significance in the trade than formerly.

The diagram on page 42 shows the general relation between Indian and international price levels but for a more precise comparison it is desirable to explain how the trade arrives at the United Kingdom c. i. f. equivalent of the current local price in Karachi and up-country. The rough calculation given below is based on current (October 1936) freights (sea and rail) dock and municipal charges and other incidentals all of which are liable to vary from time to time.

	Rs.	a.	p.
Wholesale price at Lyallpur market per maund (82.28 lb.)	2	13	10
Add :—			
Charges at Lyallpur :—			
Terminal tax @ 3 pies per md. Market charges including cartage to station @ Re. 0/1/3 per md., and approx. cost of B.twill bags, Re. 0/1/3 per md.		0	2 9
Buying price—free on rail—Lyallpur	3	0	7
Equivalent rate per candy (656 lbs.)	24	4	6
Railway freight from Lyallpur to Karachi @ Re. 0/11/10 per md. less export rebate @ 25 per cent.	4	7	0
Buying equivalent in Karachi (f.o.r.)	28	11	6
Add :—			
Charges at Karachi :—			
	Rs.	a.	p.
Terminal tax @ 3 pies per md.	0	2	0
Wharfage @ Rs. 1/3/- per ton	0	5	7
Handling (cleaning and dressing) @ 4 annas per candy	0	4	0
Godown rent @ 4 annas per ton	0	1	2
Brokerage @ 3 pies per md.	0	2	0
		0	14 9
	29	10	3

	Rs. a. p.
Brought forward	29 10 3
Shipper's commission @ 1 per cent.	0 4 9
Cost f.o.b. Karachi	29 15 0
Equivalent price in shillings per quarter of 480 lbs. (Exchange rate Re. 1 = 1/6)	Sh. 32·82
<i>Add :—</i>	
	Shillings.
Insurance $\frac{1}{2}$ per cent.	·16
Superintendence (a) 6d. per ton	·11
Freight @ 24sh. per shipping ton of 18 cwt. ..	5·71
Brokerage @ $\frac{1}{2}$ per cent.	·20
*Difference between Karachi selling and London buying basis (a) $2\frac{1}{2}$ per cent. (The barley content being reckoned at half the value of wheat) ..	1·00
	Sh. 7·18
United Kingdom price per quarter of 480 lbs. (Cost, Insurance and Freight—London)	Sh. 40·00

It will be observed that no account has been taken of interest as this item depends not only on the length of time the goods lie at the port in India after having been paid for and pending shipment, but also on the method of financing adopted. Shippers normally finance themselves in India by selling sterling in the shape of Telegraphic Transfer or 3 months sight bills on London, whichever happens to be the more favourable. The calculation of interest is, therefore, closely associated with money market conditions and the rates at which funds can be obtained.

Another important factor which is discounted by the trade in the conversion of the c. i. f. sterling price to local parity is the gain in weight due to the more humid atmosphere at the port, and the gain on analysis which accrues from the careful preparation of the wheat for shipment by prudent manipulation in the shippers' godowns. The foregoing calculation has omitted this item as it varies from season to season according to current crop and other conditions. It is, however, estimated that the net gain after allowing for dryage or loss in weight during sea transit and the results of analysis in London, is normally in the neighbourhood of $\frac{1}{2}$ to 1 per cent. although injudicious buying, errors in analysing deliveries and abnormal crop conditions may result in a loss instead of a gain under this head.

*Exporters' normal buying basis includes a non-mutual free allowance of $1\frac{1}{2}$ per cent. dirt and 2 per cent. barley. The selling basis in the United Kingdom is for clean wheat only. It may be observed, however, that the normal price quotations in Karachi for the internal trade are made on a mutual basis of 3 per cent. dirt and 5 per cent. barley.

B.—Indian prices—Official and trade.

Even in the Punjab where wheat is traded on a more or less organised basis in several large markets and where variations in type and quality are not large, serious differences are apparent between official and trade prices (*see* Appendix XVII). For example, the average gazette prices at Amritsar for the year 1935-36 have been recorded as Rs. 2-7-4 per maund while prices obtained from local traders work out at Rs. 2-4-6. This indicates an average disparity of 7 per cent. but the actual difference in individual months is from 3 to 13 per cent. At Lyallpur the two series of prices are more in sympathy with an average disparity, taken over 18 months, of only $1\frac{1}{2}$ per cent. and with a maximum difference of a little over 7 per cent.

It is reported that some merchants keep two sets of records—one for their own use and one for income-tax purposes. The discrepancy between official and trade prices obtained in the course of this survey from associations and the books of reputable merchants cannot be accounted for in this way. There is no definite bias. A series of examples taken at random in the Central Provinces markets of Damoh, Harda and Jubbulpore show that in May 1932 in the first named centre the official price was 26 per cent. lower than merchants'. In March 1933 the official rate as reported was 21 per cent. higher, while in March 1934 it was 20 per cent. lower. At Harda in March 1932 and January 1934, the official average prices were 20 and 15 per cent. higher respectively than merchants' prices. At Jubbulpore in June 1932 the official average prices were 13 per cent. lower than the corresponding trade quotations.

In Bombay similar differences occur not only in respect of wholesale but also in retail prices. In many cases the official retail prices are shown as having been lower than wholesale. In Ahmedabad during 1932-33 the average annual retail price was reported as Rs. 4 per maund while the official wholesale price was given as Rs. 4-4-8. At Poona during April and June 1935 the retail prices recorded were apparently as much as Re. 0-10-9 and Re. 1-1-2 per maund below the respective average wholesale prices of those months. Similar inconsistencies occurred at Bijapur during July and August 1934 when retail prices were approximately 11 and $6\frac{1}{2}$ annas below wholesale. There is a possibility, of course, that these differences may be due to the practice which existed before the Bombay Government introduced the Standard Weights and Measures Act last year whereby a heavy seer was used for buying and a lighter one for selling. In Bombay city, however, an investigation into the system of price collection showed that the quotations furnished by the Collector's office were for a quality which represented only about one-sixth of the total stocks of wheat in that city and as such could not represent the average state of the market.

Personal enquiries from a number of officials amongst whose other duties is the task of collecting and verifying prices showed that many did not realise the extent of their responsibilities. In one instance in the Punjab, for example, where the Tahsil headquarters was at some distance from the market, the collection of prices was entrusted to a menial. For showing long period trends

and in some cases for indicating seasonal variations official prices may be of some use but for commercial or marketing purposes they are of little or no value.

C.—Seasonal variations.

The average monthly deviations from the annual mean wholesale prices in the major markets of various producing and port areas are briefly as follows :—

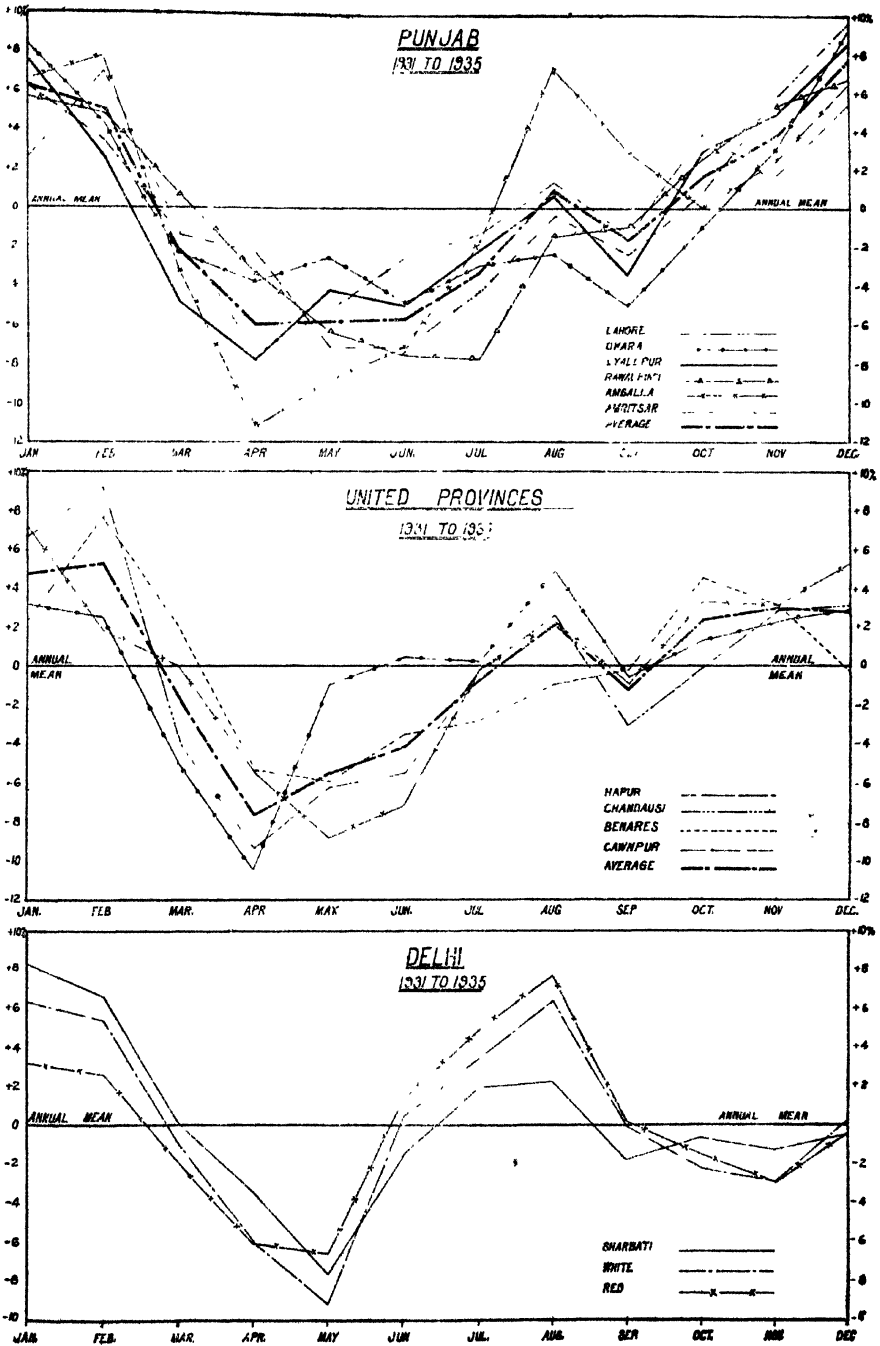
(1) *Punjab*.—The extreme range of variation occurs at Ambala, an important consuming market, between February and April and amounts to 19 per cent. which is equivalent to Re. 0-7-7 per maund, the high point being in February and the low in April. As the diagram on page opposite shows, prices have a downward tendency from January at Lyallpur, Okara, Lahore and Rawalpindi and from February at Ambala and Amritsar. These culminate in low points during April, May and June in the large producing areas and in July at Rawalpindi which is mainly a consuming market. Thereafter the tendency is upwards until August. A small dip occurs in September but prices recover and rise steadily throughout the autumn and winter months. In January prices are higher than the annual mean by 6.2 per cent. or Re. 0-2-5 per maund. The average low point occurs in April, when the crop is about ready for cutting and is 6 per cent. or roughly Re. 0-2-4 below the mean, while in December the peak is reached at 7.7 per cent. or Re. 0-3-0 above the annual average. On the whole it may be said that seasonal variations in the Punjab do not show conflicting tendencies.

(2) *United Provinces*.—The diagram on page opposite clearly shows the harvest decline which starts in the pre-harvest month of February. The maximum fall occurs at Hapur, a centre holding large stocks and the most important wheat market in the province, in April, and is 10.5 per cent. or Re. 0-4-2 per maund below the annual mean. The extreme range of variation is Re. 0-10-1 per maund or almost 19 per cent. as in the Punjab, and takes place at Chandausi, another important exporting market, between February (high) and April (low). The next greatest movement also takes place at Hapur between April and August in an upward direction to the extent of about 15 per cent. Chandausi, however, shows the widest fluctuation of any market in the United Provinces.

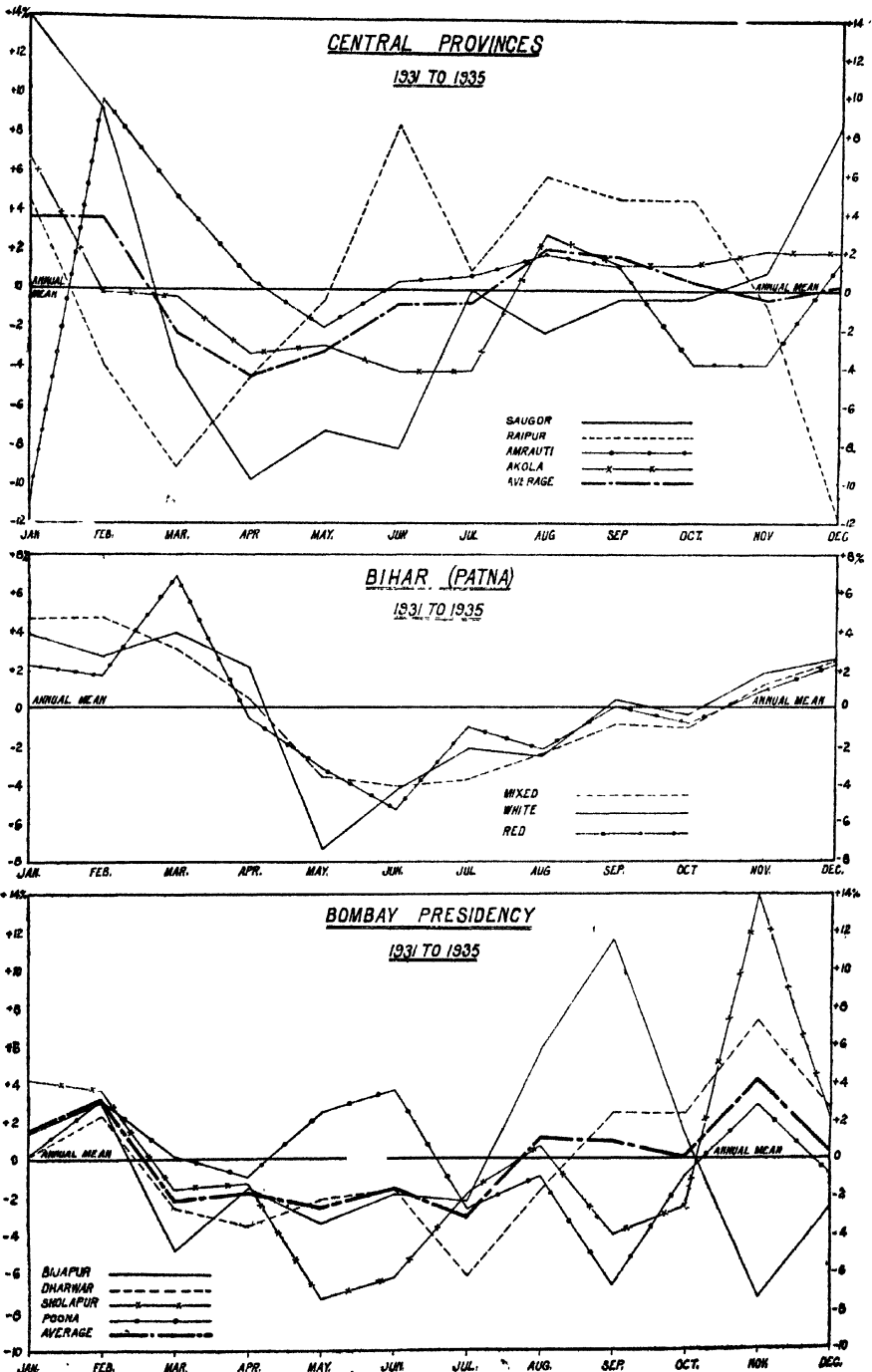
September prices in the United Provinces decline as in the Punjab. Thereafter they recover until the end of the year, with the exception of Benares market where the prices apparently recede a little in December.

Taking the province as a whole, the average price rises from 4.7 per cent. or Re. 0-2-5 per maund in January to 5.25 per cent. or Re. 0-2-10 per maund above the annual mean in February and declines to almost 8 per cent. or Re. 0-3-9 per maund below the mean in April—the lowest point of the year. Thereafter there is a steady rise broken by two recessions between May and June, and August and September. On the whole, a somewhat similar tendency is shown to that seen in the Punjab except that the autumn and winter rise in the latter province is more pronounced.

Percentage Deviation of the average monthly wholesale prices from their annual mean.



Percentage Deviations of the average monthly wholesale prices from annual mean.



(3) *Delhi*.—This small province sandwiched in between the Punjab and the United Provinces is a deficit area and imports on an average about 70,000 tons of wheat annually. The seasonal variations here are clear cut and follow the Punjab trend fairly closely (see page 81).

In January the prices of *sharbat*i and of ordinary white and ordinary red wheat are higher than the annual mean by 8.2 per cent. or Re. 0-2-6 per maund, 6.3 per cent. or about Re. 0-2-4 per maund and 3.2 per cent. or Re. 0-1-4 per maund respectively. In February there begins an all-round decline in the price level which gathers momentum during the following months and reaches a low point in the month of May. *Sharbat*i wheat falls to 7.7 per cent. or Re. 0-3-9 per maund below the average, white wheat to 9.3 per cent. or about Re. 0-3-6 per maund, while red touches 6.7 per cent. or Re. 0-2-10 per maund below the annual average for the quinquennium. The total fall in price during the five months approaching harvest is, therefore, 15.9, 15.6 and 9.9 per cent. for *sharbat*i, white and red wheats respectively representing Re. 0-6-3, Re. 0-5-9 and Re. 0-4-3 per maund.

After harvest the price level tends to rise steadily during the monsoon months, until a peak is reached in August when the price of *sharbat*i is 2.2 per cent. or Re. 0-1-1 per maund above the annual average, that of white wheat 6.3 per cent. or Re. 0-2-4 per maund and of red 7.7 per cent. or Re. 0-3-3 per maund. The total rise in price in the course of three months is 9.9, 15.6 and 14.4 per cent. for *sharbat*i, white and red wheats respectively representing Re. 0-4-10, Re. 0-5-9 and Re. 0-6-2 per maund. September shows a sharp fall common to all the three wheats, but after November all these again resume a sympathetic trend upwards.

(4) *Central Provinces*.—As shown in the diagram on the opposite page, at Saugor, the centre of a large producing area, the price level is at its highest in January, i.e., 14.2 per cent. or Re. 0-5-7 per maund above the annual mean. By April, however, it has dropped to nearly 10 per cent. or Re. 0-3-10 below the mean, a total fluctuation of about 24 per cent. or Re. 0-9-5 per maund. At Amraoti and Akola, in the Berar consuming markets and at Raipur price variations are irregular. The average for the province as a whole indicates a less range of variations than might be expected from certain individual markets and is not as pronounced as in the United Provinces. This, as will appear later, is due to the fact that the seasonal price movement of *durum* types does not coincide with that of *vulgare* wheats. From existing price data in the province the lowest point is on an average about 4.5 per cent. or Re. 0-1-11 per maund below the annual mean, and the highest is less than 4 per cent. or Re. 0-1-3 per maund.

(5) *Bihar and Orissa*.—The price quotations obtained from this province have proved to be both meagre and unsatisfactory. At Patna, an important consuming centre, the price level of white wheat is subject to greater variations than red or mixed wheats. The extreme range of variation is, as shown in the diagram on page opposite, between March and May and amounts to about 11.5 per cent. or Re. 0-5-4 per maund. In the former month the average price

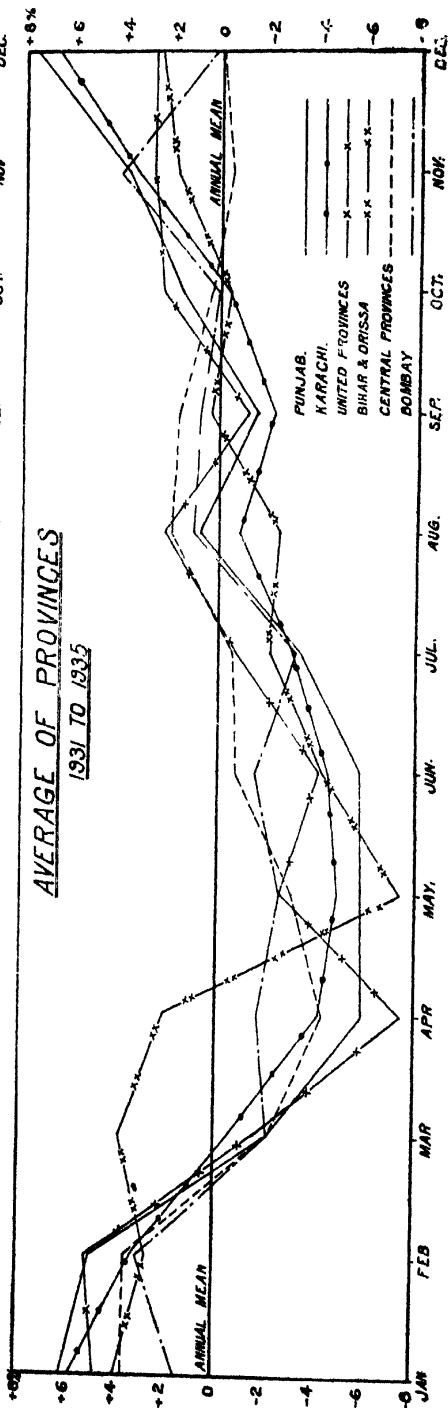
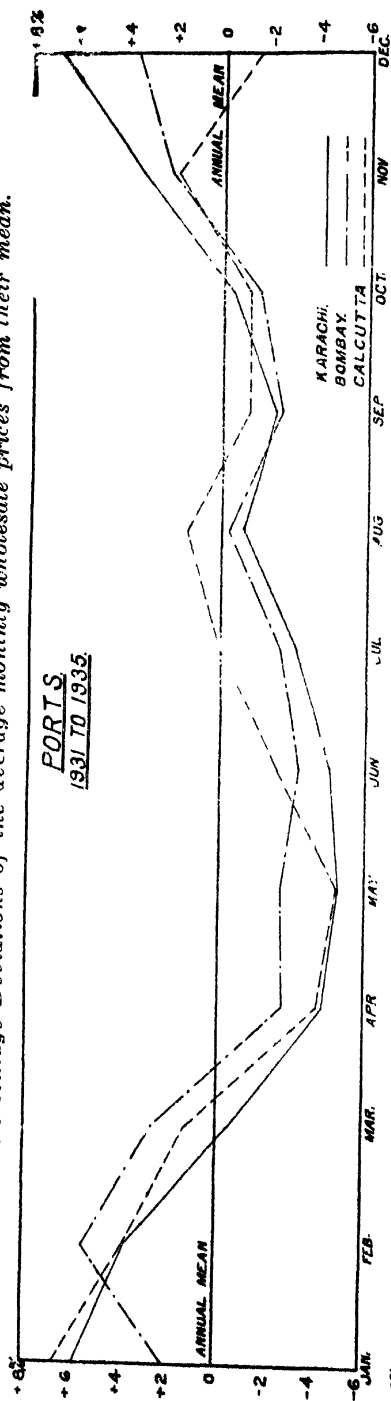
of white wheat is 4 per cent. or Re. 0-1-10 per maund above the mean and in the latter 7.5 per cent. or Re. 0-3-6 per maund below. From this low point there is a steady rise with very slight falls between July and August, September and October.

(6) *Bombay Presidency*.—The seasonal variations in this province based on trade prices show remarkable irregularities (see the diagram on page 82). The harvest dip, it will be noted, is fairly common to all four markets. At this point, however, all similarity of movement ends. The rise in the Poona level from April to June is fairly sharply accentuated and there is a very pronounced upward movement from October to November followed by as sudden and violent a fall. The Bijapur curve runs counter to all the other markets with a remarkable rise between July and September and a very steep decline thereafter culminating in November in the lowest point of the year. These variations appear to be due to a variety of causes ; for example, (i) the absence of facilities for organised trading and the lack of co-ordination between markets, (ii) the fact that none of the Presidency's wheats are tenderable against any future contract in the Bombay Grain Exchanges, and (iii) the somewhat special character of the supply and a certain degree of localisation in the demand for the Southern Bombay wheats which are largely of the red *durum* type.

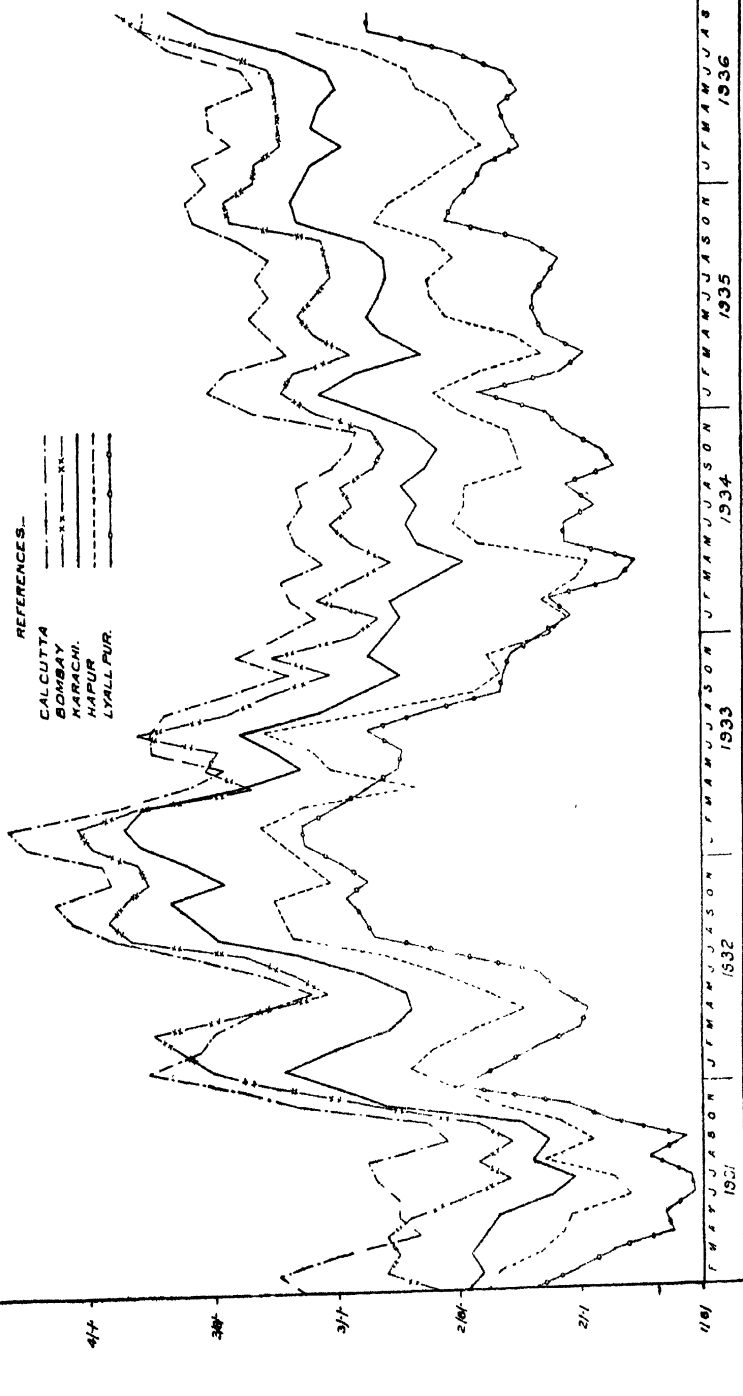
(7) *At the ports—Karachi, Bombay and Calcutta*.—It will be seen from the diagram on page 85 that the seasonal variations at these three ports all follow a similar course. The pre-harvest and harvest fall is still in evidence although its extent is not as great as in the main producing areas. The monsoon rise, the August-September dip and the subsequent winter recovery are all faithfully reproduced but on a reduced scale. Only Calcutta shows a drop between November and December owing to the sharp decline in prices towards the end of 1934 which was due probably to the very large accumulations of wheat shipped from Karachi by sea during the previous months of that year at greatly reduced freight rates brought about by a "freight war" between the two main shipping companies engaged in the coastal trade. The movement of wheat to Calcutta by sea was abnormally high in 1934-35 for this reason and formed nearly 54 per cent. of the total imports whereas in the preceding year only some 17 per cent. of Calcutta's wheat imports were by sea.

(8) *Summary*.—The most significant features of these seasonal movements are (i) the deep trough which forms between January or February and August with its low points either in April or May, (ii) the almost general drop between August and September and (iii) the late-autumn to mid-winter rise (see diagram on page opposite). The pronounced fall after January coincides with the selling pressure of old crop wheat which is particularly striking in the west of the United Provinces where pit (*khatti*) storage is the general practice (see Chapter VII). The monsoon rise may be attributed partly to the easing of the early pressure to sell and partly to the monsoon impeding rural communications and holding supplies off the market. The general fall in September appears to be due to the reopening of village communications and to the tendency in large assembling centres

Percentage Deviations of the average monthly wholesale prices from their mean.



AVERAGE MONTHLY WHOLE SALE PRICES OF WHEAT. (PER HUND OF 62 $\frac{3}{4}$ LBS) AT FIVE IMPORTANT MARKETS.
JANUARY, 1931. TO SEPTEMBER, 1936



to release stocks which in many instances have been hedged in the September position in the markets of one or other of the various "futures" trading associations. It seems to be the general experience in recent years that a large proportion of the wheat held over the monsoon and hedged in September has been tendered in that delivery month. This tends to depress the markets temporarily. The rise which normally takes place in the last three months of the year seems due to the seasonal increased consumption of wheat and wheat products in the cold weather (see Chapter II).

The excessive depression at harvest time is the most serious factor in the seasonal movement of prices. A drop in prices of about 19 per cent. year by year in some of the leading markets as the harvest reaches its height in April is a factor which demands attention. It is probable that if suitable measures were adopted in regard to storage so as to bring supply and demand into closer relationship during the three or four critical months of the harvest period, the existing great variations in the price level at this particular time would be appreciably minimised. Transport difficulties during the monsoon are also a factor which impels the grower to hurry his crop to the market before the rains commence. These problems are more appropriately dealt with in subsequent chapters.

D.—Price differences in respect of quality.

The price of wheat depends not only on market conditions but also on differences in type and quality. Except in the special case of Rajputana already referred to, in Central and Southern India generally white or amber *durums* such as *bansi*, *malwi*, *khandwa*, etc., command higher prices than red *durums* such as *kathia* and also softer wheats belonging to the *vulgare* group. The prices of *Emmer* wheat (*khapli*) are on a par with *durums* and in Madras they command a premium sometimes as much as Rs. 3 per maund over white wheats imported from Karachi. In Northern India where *vulgare* types predominate, hard wheats are almost invariably dearer than soft, and white wheats are ordinarily preferred to red. A large percentage of red grains in white wheat normally lowers the value of the whole. Prices also depend on the impurity content of the wheat, and the higher the admixture of foreign matter, the lower the price offered and *vice versa*.

In the *Punjab* during the course of this survey a series of observations of actual market transactions in the Canal Colonies showed that type 591, one of the improved high grade white wheats, passing under the general trade description of *sharbati*, fetched an average premium of $2\frac{1}{2}$ annas per maund, or roughly 6½ per cent. over fair average quality (*dara*) white wheat of the district. On various days the premiums actually ranged from $1\frac{1}{2}$ annas to 4 annas per maund. It was also observed throughout the Punjab that ordinary *sharbati*, probably consisting largely of Punjab 8-A. ranged on an average from Re. 0-1-1 to Re. 0-1-3 per maund dearer than *dara* or fair average quality mixtures. The following variations were found on each of the three days in August 1935 during which daily transactions at Lyallpur were studied

Prices of wheat (per maund) at Lyallpur.

	24th August.		25th August.		26th August.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Sharbati</i> ..	2 2 6	2 1 1½	2 2 0	2 1 9	2 3 6	2 2 0
<i>Dara</i> ..	2 1 3	2 0 0	2 1 7½	2 0 7½	2 1 9	2 0 9
Difference ..	0 1 3	0 1 1½	0 0 4½	0 1 1½	0 1 9	0 1 3

In *Delhi* the average annual differences between the best grades of *sharbati* (largely identifiable also as Punjab 8-A.) and an equivalent grade of ordinary white wheat ranged from Re. 0-2-3 per maund in 1931 to Re. 0-6-1 per maund in 1934 as follows :---

Average prices (per maund) of wheat at Delhi.

	1931.	1932.	1933.	1934.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Sharbati</i>	2 8 0	3 3 0	3 6 3	2 14 9
White Wheat	2 5 9	3 0 0	3 1 9	2 8 8
Difference	0 2 3	0 3 0	0 4 6	0 6 1

In the *United Provinces* the premium for superior hard and semi-hard wheats over the soft nondescript types is approximately the same as in the Punjab. At Agra for example, in 1935, Punjab *sharbati* was, on an average, quarter of a seer per rupee dearer than the local white wheat. This is roughly equivalent to Re. 0-1-6 per maund. Calcutta imports wheat from Chandausi, Cawnpore and Fyzabad in the United Provinces—sometimes in large quantities. These three qualities may therefore be compared on a common basis since quotations for all are available. It will be seen from the following table that Chandausi fetches a consistent premium over the other two wheats, that the premium is by no means constant and that it tends to rise in the autumn and early winter. This is due probably to the seasonal increase in the demand for a special brand of *ata* prepared in Calcutta from Chandausi wheat. The low price at

Fyzabad as compared with the other wheats is accounted for by its usually higher content of impurities, its smaller grain and a greater admixture of red wheats.

Average wholesale prices (per maund) of the United Provinces wheats in Calcutta.

Months.	Fyzabad.	Cawnpore.	Chandausi.	Premium on Chandausi over Cawnpore.
1935.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
October	3 8 4	3 10 4	3 14 8	0 4 4
November.. ..	3 7 6	3 9 1	3 14 9	0 5 8
December	3 7 0	3 9 0	3 14 0	0 5 0
1936.				
January	3 6 6	3 8 6	3 11 0	0 2 6
February	3 5 0	3 7 0	3 9 9	0 2 9
March	3 6 6	3 8 6	3 11 6	0 3 0
April	3 8 0	3 10 0	3 14 0	0 4 0
May	3 3 6	3 5 3	3 7 6	0 2 3
June	2 4 0	3 5 8	3 8 4	0 2 8
July	3 7 3	3 9 3	3 12 9	0 3 6
August	3 11 0	3 12 4	4 0 0	0 3 8
September ..	3 10 2	3 11 2	4 0 10	0 5 8
October	3 13 0	3 14 0	4 4 0	0 6 0

In the *Central Provinces* one-third of the local production of wheat consists of *durums* such as *bansi*, *jalaria*, etc., which normally stand at substantial premiums over equivalent grades of *vulgaris* as for instance *sharbat* or *farm pissi*. At Harda, an important market on the main line of the Great Indian Peninsula Railway leading down to Bombay, *jalaria*, as will be seen from the following table based on official prices, ranged from parity with *pissi* in August and September 1932 to as much as Re. 0-12-0 per maund higher in April 1933. Compared with *sharbat* a wider variation is observable, namely, from parity in October 1932 to a premium of Re. 0-14-0 per maund in October 1934. It will be noticed that the few instances in which *jalaria* was reported to be cheaper than *pissi* and *sharbat* have been ignored. This has been done in view of the questionable accuracy of the data given which, although not invalidating the general conclusion, must nevertheless be accepted with caution in abnormal cases.

Average premiums on *jalalia* wheat at Harda (C. P.).

(Note.—Figures in brackets show discount.)

	Over Pissi.			Over Sharbati.		
	1932.	1933.	1934.	1932.	1933.	1934.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January ..	0 5 0	Nil.	0 5 0	0 5 0	(0 3 0)	0 4 0
February ..	0 5 0	(0 7 0)	0 10 0	0 6 0	(0 6 0)	0 8 0
March ..	0 9 0	0 9 0	0 6 0	0 9 0	(0 9 0)	0 4 0
April ..	0 10 0	0 12 0	0 7 0	0 6 0	0 6 0	0 5 0
May ..	0 2 0	0 9 0	0 7 0	(0 4 0)	0 6 0	0 4 0
June ..	0 3 0	0 5 0	0 5 0	(0 3 3)	0 3 0	0 2 0
July ..	0 2 0	0 2 0	0 6 0	0 2 0	(0 1 0)	0 7 0
August ..	Nil.	0 5 0	0 8 0	(0 3 0)	0 1 0	0 6 0
September ..	Nil.	0 10 0	0 9 0	0 5 0	0 10 0	0 5 0
October ..	0 1 0	0 10 0	0 2 0	Nil.	0 5 0	0 14 0
November ..	0 3 0	0 10 0	0 10 0	0 1 0	0 9 0	0 7 0
December ..	Nil.	0 8 0	0 6 0	(0 1 0)	0 4 0	0 4 0

Regarding other types the following examples have been selected as representative and typical of the premium in each case. At Akola on 14th August 1936 *bansi* (*durum*) was Rs. 4-8-0 per maund, *jalalia* Rs. 4-3-0 per maund and *farm pissi* Rs. 3-14-6 per maund. *Kathia*, a red *durum*, was the lowest of all the qualities quoted, namely, Rs. 3-5-0 per maund. The extreme price range at this market was, therefore, Rs. 1-3-0 per maund.

At Nagpur, the capital and the largest consuming centre in the Central Provinces, *hansia*, a soft to semi-hard wheat of the *vulgare* group, was quoted at Rs. 3-8-0 per maund on 12th August 1936 while at the other end of the range Rs. 4-10-0 was asked for *jalalia* (*durum*). At Barhanpur another important consuming market in the west of the Central Provinces the rate for *bansi* (*durum*) on the 15th of the month was Rs. 4-4-0 per maund while that for *sharbati* (*vulgare*) was Rs. 3-8-0. At Itarsi, further to the north-east in the Hoshangabad district, whence wheat is largely exported, mainly to Berar, the difference between the lowest and highest quoted qualities was not as pronounced as in the areas of consumption. On the 11th August, for example, high grade *bansi* at this market was Rs. 3-4-0 to Rs. 3-6-0 per maund, inferior qualities Rs. 3, while *sharbati* was between Rs. 2-14-6 and Rs. 3 and *kathia* Rs. 2-12-0. The local equivalents of *sharbati* and ordinary white wheat are known in the Central Provinces

as *farm pissi* and *desi pissi* respectively. Both are *vulgare* wheats and the average annual difference between the two qualities based on 5-years' data is Rs. 0-2-3 per maund or rather more than 5 per cent.

In *Central India* it was found impossible to obtain a complete range of prices over a period. A few examples on various dates will however indicate the differences between the various types of wheat commonly marketed in that area. At Indore on the 26th May 1935 the *durum* group represented by *khandwa* (*malwi*), *bichalagarh*, *chalu* and *halka* (see Appendix VI), was quoted at Rs. 4, Rs. 3, Rs. 2-10-6 and Rs. 2-8-0 per maund respectively. Of the *vulgares* *farm pissi* and *chalu pissi* were quoted at Rs. 2-12-0 and Rs. 2-8-0 per maund. In the same market more than a year later on the 16th August 1936 *khandwa* and *malwi* ranged from Rs. 3-5-3 for the inferior qualities to Rs. 4-5-3 for the best. *Jalalia* was Rs. 3-10-9 and *chalu pissi* from Rs. 3 to Rs. 3-1-6. At both times the extreme price range was much the same, namely, Rs. 1-8-0 in 1935 and Rs. 1-5-3 in 1936. In Bhopal on the 29th May 1935 the white *durums*, *jalalia* and *kalabal* were quoted at Rs. 2-11-9 and Rs. 2-1-6 per maund respectively. White *pissi* fetched Rs. 2 and mixed *pissi* with a larger proportion of red grains Rs. 1-14-0. *Kathia*, a red *durum*, was marketed at Rs. 1-10-0 per maund. This latter is an exceptionally hard and flinty kind of wheat and apart from the disadvantage of colour and its reported low rate of flour to bran, it is not greatly in demand locally for the preparation of *ata*. At Bhopal the extreme price range, Rs. 1-1-9, was lower than that at Indore.

In *Hyderabad (Deccan)* the figures relating to quality differences appear to be more reliable and informative than any obtained from other areas in south and Central India. Contrary to the general practice in other parts of India it is customary for traders in the district towns to classify their wheat by types such as *bansi*, *sharbat*, red, etc., although this is not done in Hyderabad city itself. The differences in price between various qualities are shown by the following table giving the average annual prices for the period 1931-35 at the capital.

Average annual prices (per maund) at Hyderabad (Deccan).

—	1931.	1932.	1933.	1934.	1935.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Bansi</i>	4 4 1	4 5 3	4 4 9	4 5 7	3 15 7
<i>Peela</i>	3 14 5	4 2 6	4 1 9	4 2 8	3 9 6
Red *	3 5 4	3 10 9	3 8 10	3 8 9	3 1 0

Both *bansi* and *peela* are *durums* but the former sells at a higher price by reason of its general appearance, boldness and regular con-

*Comparison between red and white wheats is dealt with on pages 93-98.

sistency. The differences are variable and ranged from Re. 0-2-9 per maund in 1932 to Re. 0-6-1 in 1935. Comparison with the *vulgare* wheats is not possible as the latter are not imported into the State in any appreciable quantities.

In *Madras city* the price difference between fair average quality Karachi wheat imported by sea and *khapli* (*Emmer*) grown locally and in the Carnatic (Bombay) and known in Madras as *samba*, is not only very wide but extremely variable as shown in the following table :—

Average monthly prices (per maund) of wheat in Madras.

	1932.		1933.		1934.	
	Karachi wheat.	Emmer.	Karachi wheat.	Emmer.	Karachi wheat.	Emmer.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January ..	3 15 11	7 2 4	4 9 0	5 8 0	3 9 5	5 5 11
February ..	3 14 6	7 0 11	..	..	3 7 9	5 5 11
March ..	4 6 1	7 0 11	..	..	..	..
April ..	..	..	4 6 11	5 4 0	..	..
May ..	..	..	..	..	3 14 11	5 3 6
June ..	..	..	..	..	3 6 1	5 2 0
July ..	..	..	..	..	..	..
August ..	..	..	..	5 1 0	..	..
September ..	3 13 9	5 12 9	3 11 7	..	..	..
October ..	3 14 11	5 11 0	..	..	..	..
November ..	4 9 5	5 2 6	..	..	..	..
December ..	4 13 7	5 14 3	3 5 7	5 8 6	..	..

It may be noted also that *khapli* (*Emmer*) is usually at a premium over imported white *durum* such as *khanduva* (*Khandwa*). In October 1935 for instance, the retail price of *khapli* in Madras city was about Rs. 5-3-9 per maund while *khanduva* was Rs. 4-12-0.

In the *Bombay Presidency* the official prices, as already indicated, are unsatisfactory for commercial purposes. In view of this, therefore, the prices of various qualities on certain days as actually observed in the course of the marketing survey at Bombay,

Sholapur and Bijapur are given below :—

Prices of wheat (per maund) in certain markets in Bombay.

			<i>Durum.</i>		<i>Emmer.</i>		<i>Vulgar.</i>
			<i>Bansi.</i>	<i>Khandwa.</i>	<i>Bijapur red.</i>	<i>Khapli.</i>	<i>Sharbati.</i>
			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Bombay	..	..	..	4 14 10	..	..	4 3 7
Sholapur	..	..	4 11 10	..	3 14 4	4 1 0	..
Bijapur	..	..	4 2 5	..	3 4 6	3 8 9	..

In Bombay a high grade *durum* such as *khandwa* was Re. 0-11-3 per maund dearer than the best grade of *sharbati*. The differences between *bansi* (a *durum* similar in general characteristics to *khandwa*) and red *Bijapur* at Sholapur and Bijapur were Re. 0-13-6 and Re. 0-12-11 per maund respectively. At Sholapur *khapli* was Re. 0-2-8 per maund dearer than red *Bijapur* while at Bijapur itself the premium was, on the same day, Re. 0-4-3 per maund. The following table shows the different prices in rupees per maund of various grades of local white or mixed and red *durums* at Hubli, Dharwar and Belgaum during August 1936.

Prices of white and red wheats (durums) (per maund).

			<i>White.</i>			<i>Red.</i>		
			No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.
			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Hubli	..		3 6 7	3 5 6	3 4 6	3 0 9	2 15 0	2 13 6
Dharwar	..		3 7 4	3 6 3	3 5 2	3 2 7	3 1 3	3 0 4
Belgaum	..		3 8 10	3 6 7	..	3 4 6	3 3 6	3 2 6

(1) *Differences between prices of white and red wheats.*—White wheat is mostly dearer than red except, as already mentioned, in Rajputana and parts of the surrounding country. Throughout the wheat producing tracts of Northern India the average premium at which white wheat is quoted over red ranges from a minimum of Re. 0-1-0 to a maximum of about Re. 0-2-0 per maund although these limits may be exceeded at times and in different markets according to local conditions. In Jullundur, the centre of a rela

tively important red wheat area, an examination of daily quotations during May, June and July 1935 reveals that the lowest difference was Re. 0-0-7 on the 9th May, the highest was Re. 0-5-9 on the 15th July (Appendix XVIII). More often than not the premium on white wheat exceeded Re. 0-2-0 per maund.

In Delhi, an important consuming centre, the average annual differences between white and red wheat in the years 1930 to 1934 ranged from Re. 0-1-2 in 1934 to Re. 0-2-0 per maund in 1932. In October 1936 white wheat was on an average dearer than red by Re. 0-2-0 per maund.

In the United Provinces and particularly in the western area, red wheat may be anything from Re. 0-1-0 to Re. 0-4-0 per maund below white. The differences between annual average official wholesale rates of red and white wheats at Benares in the Eastern U. P. over four years are as follows :—

Prices (per maund) of white and red wheats at Benares.

—						White.	Red.	Difference.
						Rs. A. P.	Rs. A. P.	Rs. A. P.
1932	..	..	..	..	..	3 12 4	3 7 4	0 5 0
1933	..	..	..	..	..	3 10 8	3 4 9	0 5 11
1934	..	..	..	..	..	3 6 2	2 14 11	0 7 3
1935	..	..	..	..	..	3 9 4	3 4 4	0 5 0

The relatively high premium on white wheat is probably due to the local preponderance of red wheat so that to meet the requirements for white wheat some has to be imported from other districts in the west of the province.

In Bihar red wheat which forms more than 50 per cent. of the local production, may often be quoted at a substantial discount below white. At Dharbanga, for instance, *desi* red was quoted at Rs. 3-3-9 per maund on 2nd November 1935, while United Provinces white wheat was valued at Rs. 3-11-6, a difference of Re. 0-7-9. A few days later in the same month at Sitamarhi and Motihari the difference was Re. 0-7-0 and at Purnea Re. 0-6-0. At Muzaffarpur, on 10th November 1935 red *desi* wheat was marked at Rs. 2-15-6 per maund while white *desi* was Rs. 3-7-6, a difference of Re. 0-8-0. At Samastipur, on 1st November 1935, red *desi* wheat was Re. 0-6-6 cheaper than imported Punjab *sharbati*.

The differences between the annual average prices of white and red wheats are the fairest indication of the amount of the premium

on the former. In the Dinapur market, for example, these were as follows :—

							Rs. A. P.		
1931	..	..	..	..	..	..	0	4	6
1932	..	..	..	..	..	..	0	2	9
1933	..	..	..	..	..	..	0	3	3
1934	..	..	..	..	..	..	0	2	7
1935	..	..	..	..	..	..	0	3	5

The premium may vary from month to month as is shown below :—

(Per maund.)

1935.						Red.	White.	Premium.
						Rs. A. P.	Rs. A. P.	Rs. A. P.
January	..	..	..	..	..	2 11 9	2 15 0	0 3 3
February	..	..	..	..	..	2 12 0	2 15 11	0 3 11
March	..	..	..	..	..	2 12 6	2 15 7	0 3 1
April	..	..	..	..	..	2 12 3	3 0 2	0 3 11
May	..	..	..	..	..	2 12 3	2 14 10	0 2 7
June	..	..	..	..	..	2 10 0	2 13 2	0 3 2
July	..	..	..	..	..	2 9 8	2 11 9	0 2 1
August	..	..	..	..	..	2 10 8	2 13 2	0 2 6
September	..	..	..	..	..	2 13 9	3 2 0	0 4 3
October	..	..	..	..	..	3 2 0	3 4 1	0 2 1
November	..	..	..	..	..	3 2 5	3 8 0	0 5 7
December	..	..	..	..	..	3 2 0	3 6 9	0 4 9
Average						2 13 3	3 0 8	0 3 5

In the central and southern parts of the country the distinction between white and red applies also to the *durum* group which forms a large proportion of the local production. In the Central Provinces, although the soft *pissis* frequently contain a large proportion of red kernels, red wheat of the *vulgare* types is very rarely grown and marketed separately, so that there are no adequate data for a price comparison of the two types.

It may be observed, however, that at Itarsi on 11th August 1936, *kathia*, a red *durum*, was selling at Rs. 2-11-0 per maund, while *sharbati* was Rs. 3 and *bansi* Rs. 3-4-0.

In Bombay and the Deccan wide differences separate red and white wheats—in most cases *durums*. The prices of both qualities in the Carnatic at Hubli, Dharwar and Belgaum during August 1936 are shown on page 93, and the differences are as follows :—

Difference between prices (per maund) of white and red wheats.

—				No. 1 white & No. 1 red.	No. 2 white & No. 2 red.	No. 3 white & No. 3 red.
				Rs. A. P.	Rs. A. P.	Rs. A. P.
Hubli	..	..	..	0 5 10	0 6 6	0 7 0
Dharwar	..	..	..	0 4 9	0 5 0	0 4 10
Belgaum	..	..	..	0 4 4	0 3 1	..

At Sholapur and Bijapur the difference in price between high grade white wheat and the local red, as already mentioned, is in the neighbourhood of Re. 0-13-0 per maund.

In Hyderabad city the average annual difference per maund between the values of selected (*bansi*) and ordinary white wheat (*peela*) and red wheat from 1931 to 1935 were as follows (all are *durums*) :—

Difference between prices of—		1931.	1932.	1933.	1934.	1935.
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Bansi</i> and Red	..	0 14 9	0 10 6	0 11 11	0 12 10	0 14 9
<i>Peela</i> and Red	..	0 9 1	0 7 6	0 8 11	0 9 11	0 8 6

On the other hand, the differences based on the combined average prices of *bansi* and red wheat at the capital and three important producing centres in the State, for the period 1931-35 are as follows :—

Average prices (per maund) of wheat at 4 markets.

—				1931.	1932.	1933.	1934.	1935.
				Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Bansi</i>	..	..	..	3 15 11	3 13 1	3 11 9	3 10 0	3 3 9
Red	..	..	..	3 3 2	2 15 7	3 2 4	3 1 11	2 9 6
Difference				0 12 9	0 13 6	0 9 5	0 8 1	0 10 3

Although it will be clear from the foregoing that the variations between the price of one quality of wheat and that of another are never constant, the data of the past four or five years make it possible to define the range of premiums and discounts likely to be encountered under normal circumstances, and the general position may be summarised as follows :—

Among white wheats *sharbat* ordinarily commands a premium over *dara* or fair average qualities of anything from about Re. 0-1-3 per maund to Re. 0-6-0 per maund. The lower figure applies in producing districts in the Punjab. The premium increases as the distance between source and consuming areas widens and is highest usually in the large cities. *Sharbat* grown in the Central Provinces also commands a premium over the ordinary *desi pissi* which may be regarded as equal to the fair average qualities of Northern India by an average of Re. 0-2-3 per maund and ranging from Re. 0-1-0 to Re. 0-6-0 per maund.

White or amber *durums* command the highest price of any wheat in India. In the main producing areas in Central India and the Deccan, the premium for selected qualities over other white wheats of the same species may, in special circumstances, be Re. 1 to Rs. 1-4-0 per maund or as much as 30 per cent. over the next grade. More commonly, however, as in Hyderabad and Bombay, the differences are in the neighbourhood of Re. 0-3-0 to Re. 0-4-0 per maund. When compared with white wheats of the *vulgare* species, however, the normal differences are much greater. In Bombay City where all types are readily available in quantity high grade *durums* such as *khandwa* and *malvi* are seldom less than Re. 0-10-0 to Re. 0-12-0 per maund dearer than the best *sharbat*, while in many parts of the Central Provinces and the south generally, the difference is usually much wider.

In regard to red wheats of the *vulgare* type the normal discount in the large producing areas is somewhere between Re. 0-1-0 and Re. 0-2-0 per maund below white. In certain areas, as for instance Bihar, where red wheat forms more than half the crop and regular supplies of white wheat are imported from the Punjab, the discount on red wheat is somewhat larger. The annual average difference for 1935 at one market was Re. 0-3-5 per maund but quotations taken on specific dates at a number of markets revealed differences of Re. 0-6-0 and Re. 0-7-0 per maund.

Large price differences exist between red and white *durums*. The discount on red *durums* may range from 4 or 5 annas per maund as in the Carnatic, to Re. 1 to Rs. 1-10-0 in Central India and the Central Provinces. It is significant that red *durum* (*kathia*) is almost invariably at a discount amounting in some cases to Annas 2 or Annas 4 per maund, even when compared with white wheat of the *vulgare* species. Quite frequently, especially in parts of Rajputana, the price of *kathia* may also be lower than soft red wheat. Actual observations in several markets in 1935 showed such discounts amounting to about Re. 0-1-0 to Re. 0-2-0 per maund.

Attention should perhaps be drawn to one further point at this stage, namely, that the high quality premium wheats are more

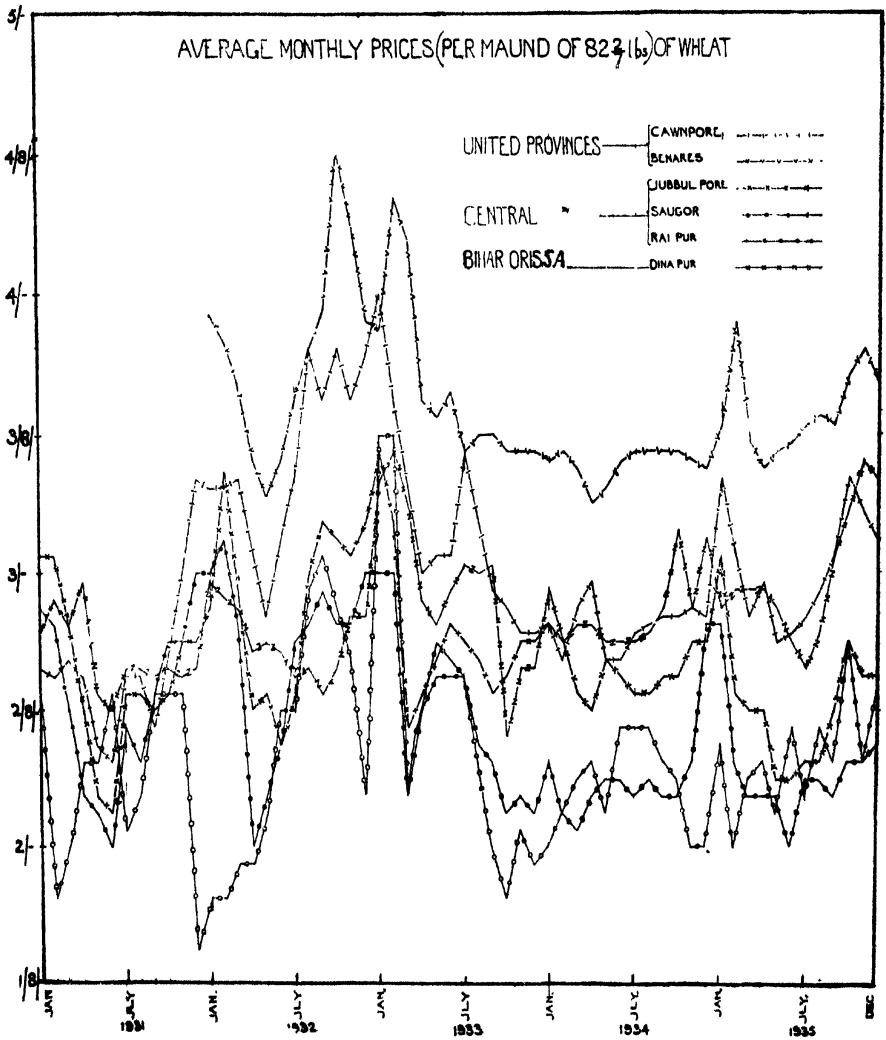
stable and less susceptible to depressing tendencies than the discount wheats. At the same time they appear more responsive to rising values. For example, in the large consuming market of Delhi the fall in ordinary white wheat between 1930 and 1934 was 30 per cent., red wheat fell 29 per cent. but *sharbat* lost only 8 per cent. In the course of the rise between 1931 and 1933 white and red wheats both regained 7 per cent. only while *sharbat* rose 17 per cent. Similarly the price of red *durum* in Hyderabad (Deccan)—the lowest quality quoted in that State—has shown more violent fluctuations than the price of any other kind of wheat.

(2) *Differences on account of refraction (impurities).*—Differences in respect of refraction are calculable with a fair degree of accuracy wherever organised trading exists, and where a standard contract is used as the basis of dealings in “futures”, or for ready or “actuals”,* as for example, at Karachi, Bombay, Calcutta and a number of interior markets in the Punjab and the United Provinces. Assuming that a parcel of white wheat contained 2 per cent. damaged, 3 per cent. “touched” (slightly damaged), 3 per cent. shrivelled and 35 per cent. of red kernels, such a delivery, if tendered at Karachi would be penalised to the total extent of 2.1 per cent., if at Bombay 5.8 per cent. and at Calcutta 5.5 per cent. At Okara, an important market in the Punjab, it would in the first place be liable to rejection as the extreme tolerance for barley is 4 per cent. but in the event of the buyer agreeing to take the lot with an appropriate scale of allowances, 3.3 per cent. would be deducted from the original buying price *plus*, probably, an extra penalty for excess barley content. At Dhuri (Patiala State) this lot would also be liable to rejection as the maximum tolerance for red wheat is only 20 per cent. In respect of the other items of refraction a deduction of 1.75 per cent. would be made. At Muzaffarnagar, where the buyer of a pit has to accept whatever damaged grain may be found in his purchase, the deduction would be 2 per cent.

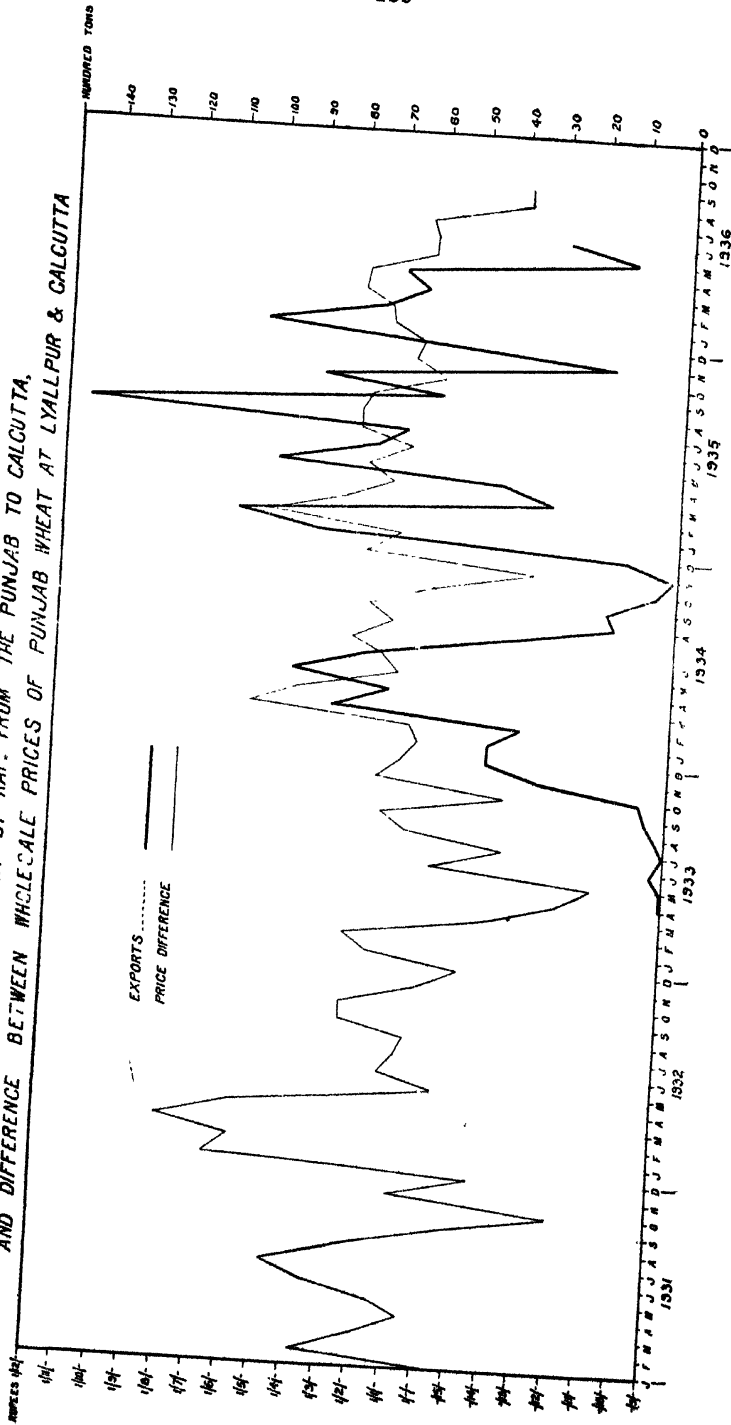
It will be clear that from the variations in these tolerances allowed by trading associations the basic prices at each of the centres which have been taken as examples are bound also to differ in a corresponding degree apart from market considerations and differences between the local basis and the average actual impurity content of the wheat as delivered. The price quotation in the case of wheat where the contract basis is mutual and allows, say, 3 per cent. foreign matter and 5 per cent. barley, cannot obviously be the same as in a market where the tolerances are non-mutual and amount only to 1½ per cent. and 2 per cent. respectively.

For the sake of affording a proper comparison in the section which immediately follows, the prices in the different markets have been corrected in accordance with the terms provided by the contract

*Ready or “actuals” are only subject to the predetermined scales of allowances at a few markets, *e.g.*, Karachi, Bombay. For ‘futures’ deliveries the normal procedure is for transactions to be based on the local standard contract. Ready sales are normally conducted after a visual examination and appraisal of the goods.



EXPORTS OF WHEAT BY RAIL FROM THE PUNJAB TO CALCUTTA,
AND DIFFERENCE BETWEEN WHOLESALE PRICES OF PUNJAB WHEAT AT LYALLPUR & CALCUTTA



in each case and brought to a common basis of refraction, *viz.*, 1½ per cent. foreign matter and 2 per cent. barley.

E.—Comparison of prices in different markets.

(1) *Vulgare.*

The diagram on page 86 shows the prices of white wheat at Calcutta, Bombay, Karachi, Hapur and Lyallpur for the period January 1931 to September 1936 (Appendix XIX). The last two markets are large assembling centres situated in surplus areas of intensive wheat cultivation. The three ports of Calcutta, Bombay and Karachi have each an important local milling industry and are large consuming markets. Karachi is also important as a centre for the distribution of wheat by sea both coastwise and to abroad.

The wheats represented on this diagram belong to the sub-species *vulgare* and for better comparison have been reduced to the common basis of 1½ per cent. foreign matter, and 2 per cent. barley. *Durum* wheats which are essentially a central and southern type and have a special market of their own are discussed separately.

It will be clear from the diagram (page 86) that the movements of prices at these five markets are not at great variance with one another particularly since the beginning of 1934. It may be observed that Lyallpur, the centre of the surplus Canal Colony area in the Punjab, has a remarkably close affinity with Karachi and, therefore, indirectly with Bombay and Calcutta. Hapur, in the west of the United Provinces, is the source from which that province as well as Bihar and, to a lesser extent, Calcutta and other towns of Bengal draw their supplies and is, therefore, the key position in the trade of these parts. It will be found that although the same general trend is evident, Hapur does not altogether reproduce the fluctuations of Lyallpur, but there is a slight tendency for Hapur and Bombay prices to move together. After about the middle of 1933 the fluctuations in the producing centres seem more pronounced than in the consuming areas and it would appear that it is mainly at the producing end that the impulse for prices to rise or fall originates. The lag for instance between Lyallpur and Calcutta when prices were on the rise from the end of 1931 until early 1933 shows this plainly.

In theory, the price of wheat at Lyallpur should tend to be equal to the price of the same wheat in Karachi or Calcutta allowing for the time factor, transportation costs and other charges incidental to dressing or preparing the wheat for market. Actually, however, this is only partly correct as the following instance will show. The cost of railing wheat from Lyallpur to Calcutta is roughly Rs. 1-3-1 per maund of which Rs. 1-0-4 is railway freight, the remaining Re. 0-2-9 being charges at Lyallpur including cost of bags. The diagram on the opposite page shows that the actual differences over a period of 3 years are far from constant and that they may vary from Re. 0-11-3 per maund as in May 1933 to Rs. 1-5-9 as in February 1935. The expanding volume of rail-borne traffic in wheat from the Punjab to Calcutta whenever the price difference approaches or exceeds Rs. 1-3-3 per maund is significant.

It is important to notice that fairly old established trading associations exist in all the 5 markets shown on the diagram on page 86

and that facilities for " futures " trading on an organised basis are afforded by all these associations. It is possible that this accounts in large measure for the sympathy in their price movements. For the sake of comparison the diagram on page 99 showing the corresponding price movements at six other markets where no trading associations exist should be consulted. A glance at this diagram will show that the price movements in those markets are frequently at variance. In May 1934, for example, the price at Raipur (Central Provinces) was falling and that at Saugor was rising ; Jubbulpore was rising while Cawnpore was falling ; Dinapore showed a tendency to fall while Benares was definitely rising. The fact that the prices in these markets are so greatly at variance amongst themselves and failed to keep pace with the movements in the larger and more organised markets, appears to indicate the need for a better system of market intelligence.

The normal spread between different markets tends to vary at different times of the year. For example, Cawnpore, which is an important consuming centre in the United Provinces, draws its supplies from the Punjab, occasionally from the Central Provinces, as well as nearer home. So long as supplies are available from local sources it is unlikely that the more distant markets will be in parity owing to the cost of transport charges. When, however, the local stocks are depleted late in the season differences begin to widen. The average monthly differences between Cawnpore and Hapur prices during the five year period 1931-35 are shown below :—

			Rs. A. P.				Rs. A. P.
January	..	..	0 10 11	July	..	..	0 6 10
February	..	..	0 8 2	August	..	..	0 7 11
March ..	..	..	0 10 7	September ..	..	..	0 8 7
April ..	..	..	0 10 1	October ..	..	..	0 9 6
May ..	..	..	0 4 8	November ..	..	..	0 9 2
June ..	..	..	0 4 11	December ..	..	..	0 10 1

The widening of the difference in March and April is probably due to the earlier harvest rush of arrivals at Cawnpore causing values to fall in greater proportion than at Hapur where ample storage accommodation exists and normally buyers are accustomed to purchase for stock in April.

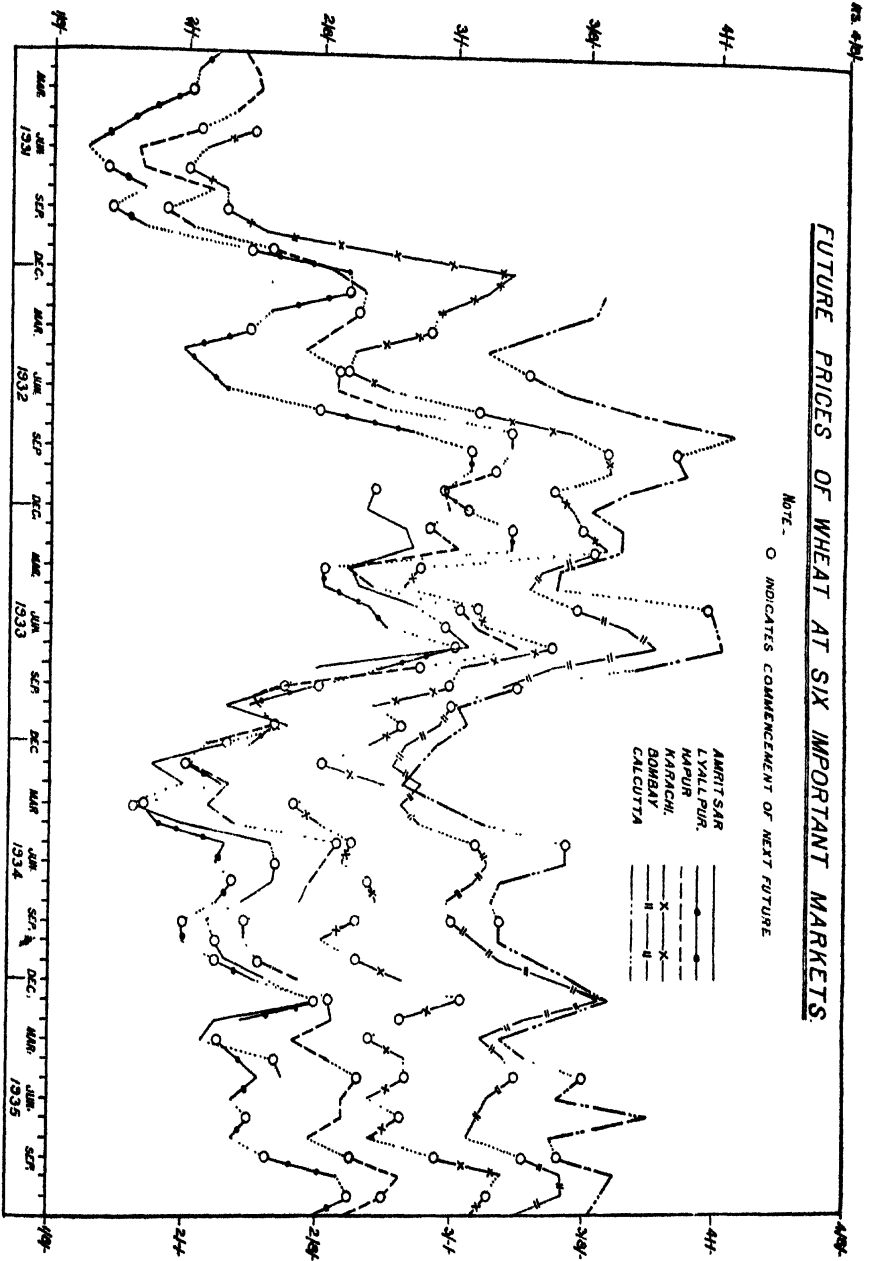
The same tendency will be observed from diagram on page 100 which shows that the price differences between Lyallpur and Calcutta are, on the whole, always wider in the off season after September or October with one or two exceptions of short duration, as, for example in October 1931, 1933 and 1934. The pronounced narrowing of the difference in 1934 was due to the price falling in Calcutta as a result of the large importations by sea from Karachi during the latter half of 1934 caused by the " freight war " rates of Rs. 1-8-0 per ton as compared with a normal of somewhere about Rs. 5

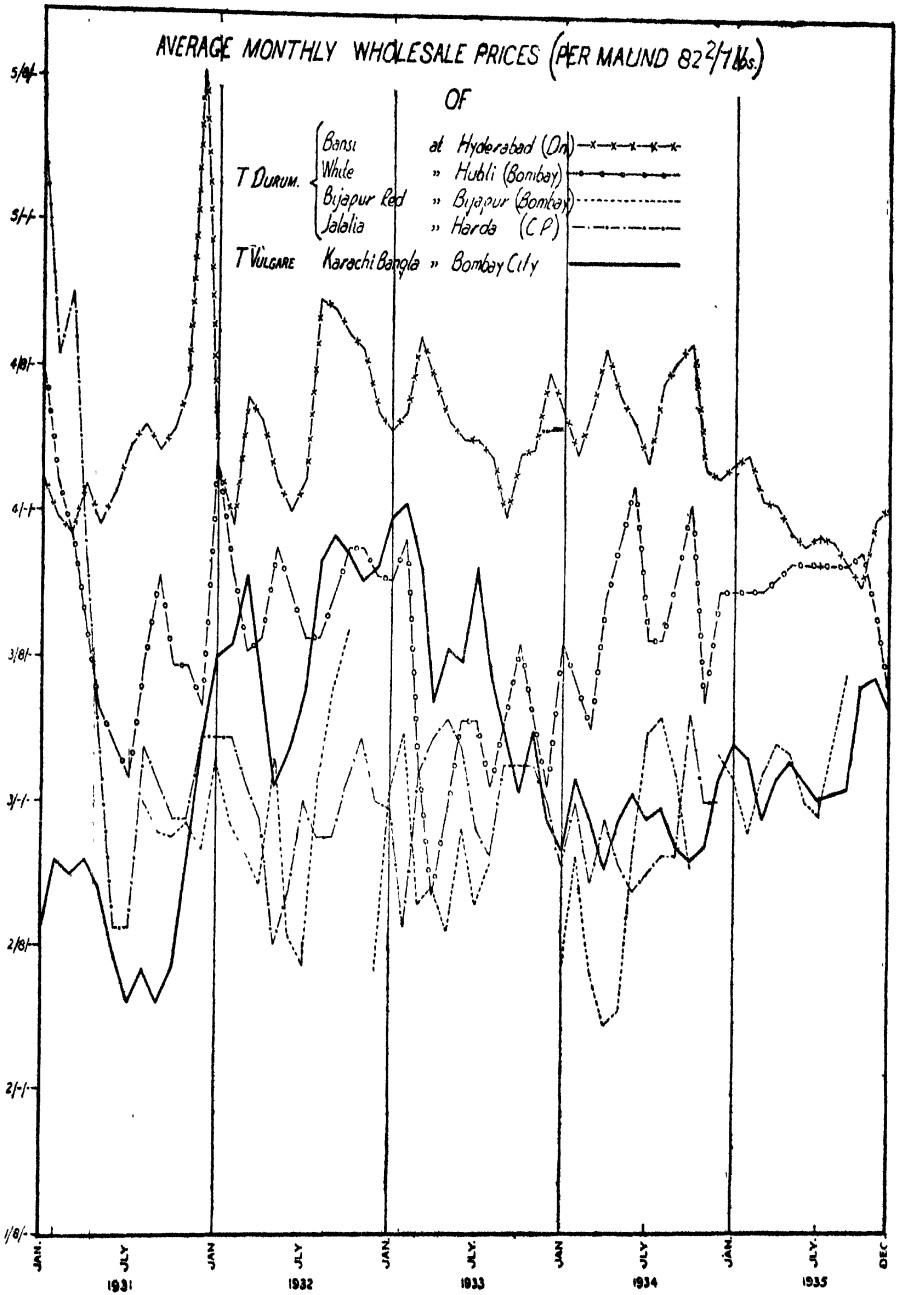
(2) *Durums.*

In South India and in many of the central parts of the country with the exception of the dense soft wheat zone in the north of the

FUTURE PRICES OF WHEAT AT SIX IMPORTANT MARKETS.

NOTE - O INDICATES COMMENCEMENT OF NEXT FUTURE





Central Provinces and parts of Central India, production of different qualities and types is not only varied but hardly sufficient for local consumption. The general directional movement of wheat from north to south by sea and rail as shown on the map facing page 230 bears this out. *Durum* wheat is of special importance in the Peninsula and has a market of its own. The prices of *durums* are therefore largely uninfluenced by the short period fluctuations of the terminal markets of Karachi or Bombay or by prices in the main surplus areas of Northern India. This will be clear from a study of the diagram on the opposite page in which the prices of three *durum* wheats of varying qualities at Hyderabad (Deccan), Hubli (Bombay) and Harda (Central Provinces) are shown against the movement of Sind-Punjab wheat (*Karachi Bangla*) at Bombay which, as already indicated, follows Karachi and Lyallpur very closely. Not only is it apparent that the *durums* as a whole are generally unaffected by prices at Bombay, although there may at times be a faint but brief suggestion of sympathy in the general trend, but as between the main *durum* centres themselves there appears to be little in the way of a common tendency (see also Appendix XX).

To what extent these divergencies are due to the absence of facilities for "futures" trading in *durum* wheat—the probable influence of trading associations in co-ordinating prices has already been noticed and illustrated in diagram on page 86—or to the lack of adequate market information it is difficult to say. One of the solutions to this problem of irregularity in prices in Southern India would seem to lie in the provision of a "futures" contract for *durum* wheats at Bombay or the establishment of a trading association or grain exchange at a centre in the midst of a *durum* producing area, such as Indore or Hyderabad where sufficient tenderable stocks would be available.

F.—Comparison of "futures" prices.

The three ports of Karachi, Bombay and Calcutta are important centres for "futures" trading. Amritsar, Lyallpur and Okara in the Punjab, and Hapur and Muzaffarnagar in the United Provinces are the chief upcountry centres. There are, however, about 60 or 70 associations where dealings of this kind take place. Most of these were instituted comparatively recently, particularly since the export trade in wheat began to fall away and with the exceptions of the three major ports already referred to all are located in the Punjab and western markets of the United Provinces.

The number of delivery months for "futures" contracts varies from 2 in the case of Calcutta to 8 at Karachi, and the months in most cases are described according to the *vikrami* calendar. The length of time during which the contracts remain open prior to the delivery months also varies (see later).

The diagram on page 103 shows the monthly average price of the nearest "future" in some of the main markets. It will be observed that on the whole the "futures" prices in these markets maintain a similar degree of sympathy as has already been observed in the case of the "ready" prices in the same markets. It may be

noticed in this case also that although the prices were frequently at variance prior to 1934 there has been, since that date, a much greater degree of sympathy in the month to month movements. It has been suggested that this is in some measure due to the more extensive use of the trunk telephone system by traders since that date.

The diagrams on pages 107 and 108 show the relation between "ready" and "futures" prices (all positions) at certain markets. An examination of these diagrams would appear to indicate that the "futures" market should have, in the main, a stabilizing effect on the "ready" prices. It will be observed that when "ready" prices are low, the "futures" quotation is generally higher, as for example, in 1931 and in 1934-35, but when "ready" prices are at a relatively high level, e.g., 1932 and 1933, the tendency is for "futures" quotations to be below those for "spot" wheat.

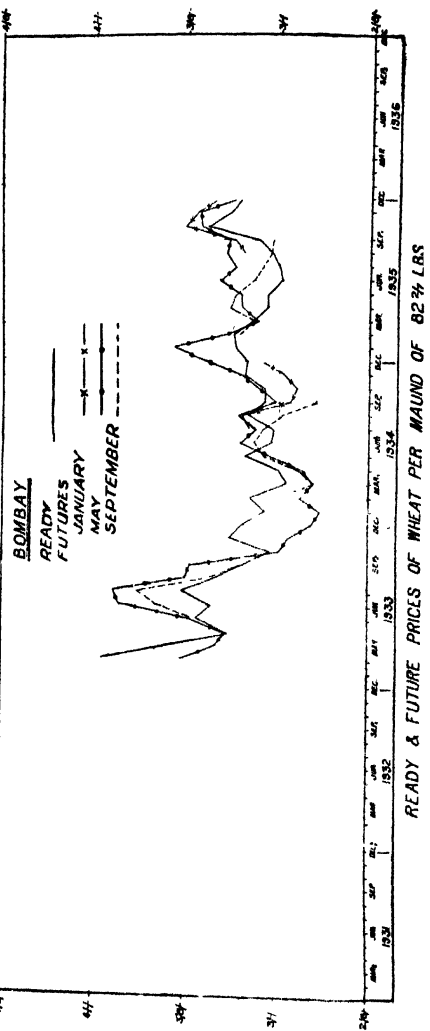
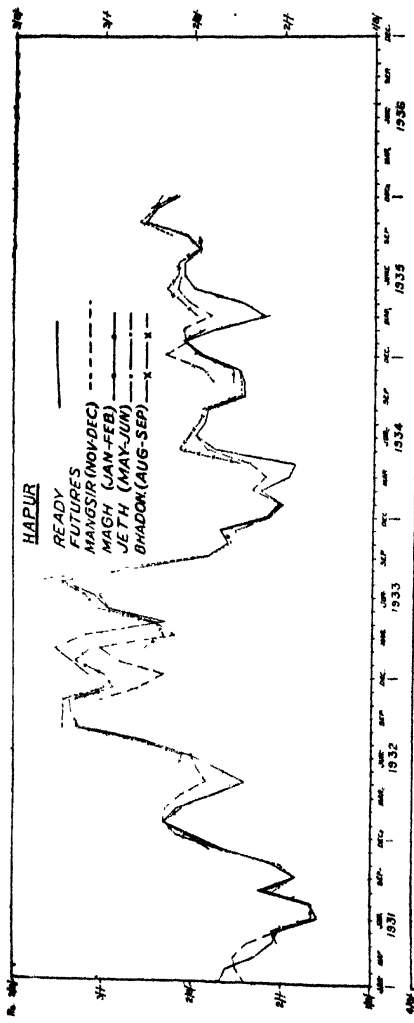
The general effect of these "futures" markets on the cash price of wheat is apparently advantageous. From Appendix XXI it appears that, taking all positions of the markets quoted since 1931, the monthly "futures" quotations have been at a premium over "ready" in at least 2 months out of 3. This is perhaps to be expected since the "future" price must normally take into consideration carrying charges. Attention should however be drawn to two particular instances, namely, the quotations of the July "future" at Karachi and of the May "future" at Calcutta.

It will be observed that the quotations for the July "future" (*har*) in Lyallpur were at a premium over "ready" prices 29 times out of 47, and that the June (*jeth*) "future" at Ilapur was at a premium 23 times out of 38. The quotations of the July "future" at Karachi are in striking contrast in so far as 32 times out of 50 the "future" quotation was at a discount and that similarly in Calcutta the May "future" was at a discount 24 times out of 42. There seems no doubt that the strong "bearish" tendency in both of those centres cannot but have an adverse effect on the upcountry buying price at harvest time. The natural tendency of Karachi merchants to get the price of Indian wheat down to export parity every year seems a factor in bringing about the "bearish" position on the July "future". Similarly the anxiety of the Calcutta buyers to purchase wheat cheaply at harvest time seems to affect the May "future" there.

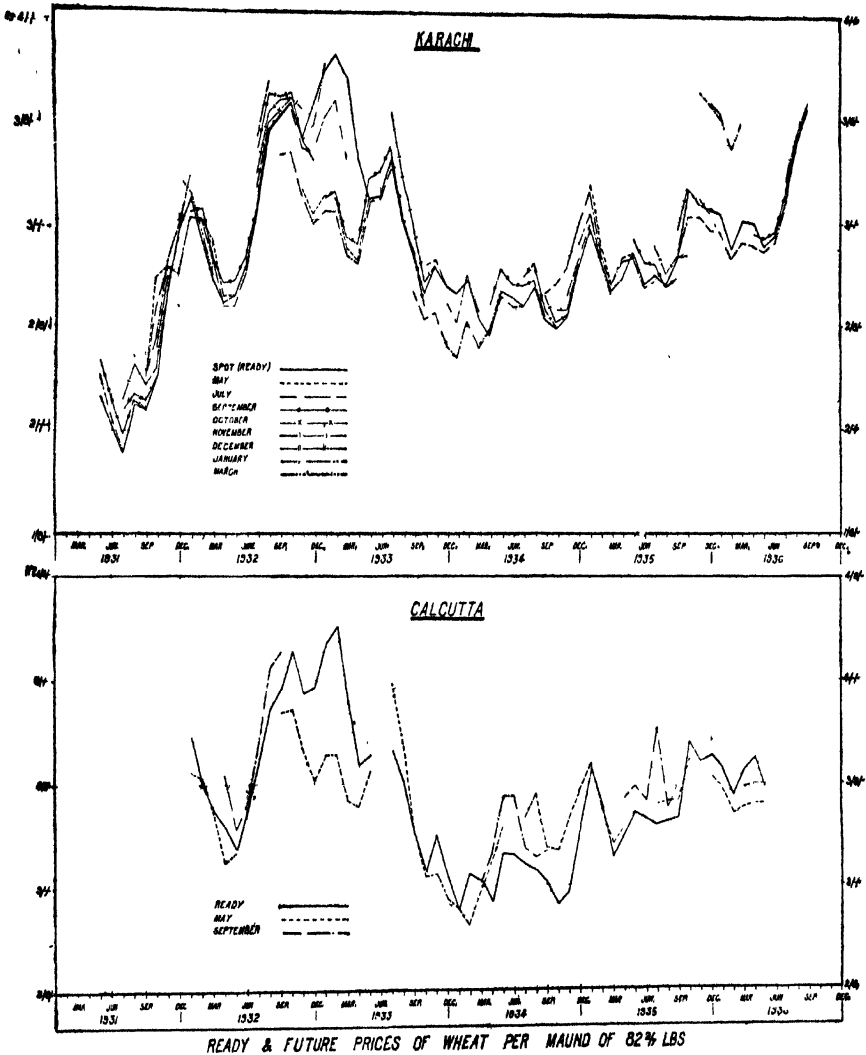
It is possible of course that as the upcountry trade associations become stronger and when inter-trading between merchants of different associations on the basis of a standard contract becomes more extensive, the "bullish" sentiment of the upcountry merchants, in conjunction with those at Bombay, may become strong enough to overcome or exploit the "bearish" tendencies of the associations at these two ports.

G.—Market Intelligence.

Locally, the growers depend very largely on reports received from their neighbours who have been to the market or from itinerant merchants and the local *baniya*, who may be in receipt of daily advices



READY & FUTURE PRICES OF WHEAT PER MAUND OF 82 1/2 LBS



from the trade. In exceptional cases larger *zamindars* may get direct news from their *arhatiyas* in the market. The wider dissemination of market information takes place through various channels, namely :—

(1) *Government publications*.—These are generally issued some considerable time after the events recorded have actually taken place. They are accordingly of historical and academical interest rather than practical use to the trade. The doubtful accuracy of official price records has already been commented on. Each provincial Government is responsible for the collection of prices within its jurisdiction. These are based on data collected by district headquarters and the system of collection is everywhere fairly similar in all main essentials, although the method of presentation and the intervals at which they are published may vary. In the Punjab, for example, Deputy Commissioners maintain registers showing wholesale and retail prices of all the important crops of the district. These registers are arranged in 12 sheets one for each month and both wholesale and retail prices are separately recorded twice monthly, *viz.*, on the fifteenth and last day of the month. The duty of keeping up these registers is entrusted to the district *qanungo*. This is an official working at district headquarters. He obtains the prices from the Tahsildar, an official in charge of a sub-division of the district, to whom they are reported by the bazaar *chaudhari**, an honorary appointment made by the Deputy Commissioner on the recommendation of the Tahsildar. The prices are then attested by an Assistant or Extra-Assistant Commissioner before being forwarded to the Director of Land Records who subsequently issues them for publication in the Government Gazette. In the United Provinces the Tahsil headquarters record daily prices as obtained by enquiry in the open market or from some *arhatiya* or merchant. In certain places such as Benares, this information is obtained by the bazaar *chaudhri*, and is passed on through channels much the same as in the Punjab before publication. Later they are consolidated and the annual average and “normal” prices are published for each district in the Season and Crop Report. In Bihar and Orissa returns covering wholesale and retail prices at 21 district headquarters are issued bi-monthly by the Director of Agriculture for publication in the Gazette. In the Central Provinces the Local Government issues a weekly Gazette giving the average weekly prices of wheat in all districts. In Bombay, prices are recorded fortnightly on the fifteenth and last day of the month as in the Punjab by the Collector of the district and sent to the Director of Agriculture who compiles and issues them for publication in the local Gazette.

In addition to these records which rarely, if ever, find their way into the hands of the general public or trade, the Indian Trade Journal published each Thursday in Calcutta by the Department of Commercial Intelligence and Statistics gives a wide range of commodity quotations as well as trade movements. The former are largely obtained from Chambers of Commerce and from market reports appearing in various trade periodicals. The latter are

*Usually a trader and as such one familiar with market practices.

reproduced from monthly official publications such as Rail and River Borne Trade of India or Seaborne Trade of India and are supplemented by the latest available data. The weekly arrivals and despatches of certain staple commodities including wheat and wheat flour at thirty-six important centres are also given in the Journal together with figures for the corresponding week of the previous year.

A new series of prices made its first appearance in the pages of the Indian Trade Journal on 6th August 1936. These are harvest prices of the principal crops, based on the average of weekly quotations during the harvest period, collected mainly through non-official agencies, principally branches of the Imperial Bank of India. It is stated that "the object of these series is to obtain a better indication of the prices which the cultivator actually receives for his crops, than is obtainable from the records of prices that are now available x x x x . The choice of centres has, however, been restricted owing to the difficulty of securing reliable agencies for reporting prices. In all, 16 commodities and 93 centres have been chosen. x x x x x x . The quotations relate to grades which are handled largely at each centre".*

The Indian Trade Journal also publishes the all-India crop forecasts in detail by provinces and States, as well as weather and crop reports. A weekly cable from the Director General, Commercial Intelligence and Statistics, to the High Commissioner, London, the text of which is published in the Indian Trade Journal, contains a summary of the latter as well as the prices of certain staples such as cotton, jute, wheat and rice. Foreign crop news received by the Department of Commercial Intelligence and Statistics by cable are also published from time to time in the Indian Trade Journal.

Five all-India forecasts for wheat are issued annually by the Director General, Commercial Intelligence and Statistics. These are based on the provincial estimates compiled by the Director of Land Records or Director of Agriculture from the primary material gathered by the district staff. The provincial forecasts are four in number and are published in advance of the all-India forecasts. In the Punjab, for example, the approximate dates of issue are 20th January, 1st March, 10th April and 15th May. A copy of each forecast is supplied to the Director General, Commercial Intelligence and Statistics, the Senior Secretary to the Financial Commissioner and to the Superintendent, Government Printing Press, Lahore. Copies are also posted up on the notice boards in the offices of the Directors of Land Records and of Agriculture and the Director of Telegraphs, Lahore, for the information of the public. Printed copies of these forecasts are also supplied *gratis* to various firms in and outside India. The five all-India forecasts are issued from Calcutta ten days to a fortnight later than the provincial forecasts, *e.g.*, on or about 31st January, 15th March, 20th April, and 30th May, and the final one on 10th August.

*Introductory Note.—Statistics of Harvest Prices of the Principal Crops, page 657, Indian Trade Journal.

(2) *Daily newspapers*.—Practically all the important dailies have one or two pages devoted to commercial news. The source of international trade news may be a news agency such as Reuters or the Associated Press of India, while prices and market reports from the more important centres in India are often furnished by the papers' own local correspondents. Official crop forecasts are also issued to the press for wider publicity. Local Governments sometimes have their own arrangements with the press for the publication of price movements or any other information relating to the more important crops of the province. An example of this is seen in the report issued monthly by the Director, Information Bureau, Lahore, and published in the Northern Indian newspapers dealing with the wholesale and retail prices of wheat and gram flour at 24 stations in the Punjab and quoting the average price of imported wheat in the United Kingdom converted into Indian currency for the purpose of comparison. Further, the condition and forecasts of important crops in other countries such as the United States of America, Canada, Argentine and Australia are received by the Director of Agriculture, Punjab, from the International Institute of Agriculture, Rome, and released for publication in the daily papers.

(3) *Trade press*.—Some of these are written and published in English at large centres such as Calcutta and Bombay, other dailies and periodicals are printed in vernacular at the smaller commercial towns up country. The more important of the former are weeklies and have a widespread circulation. Commercial and financial news of all-India significance are their main features, but special attention is usually given to commodities of local importance. For example, *Capital*, a Calcutta weekly, deals exhaustively with the jute market, while *Commerce* a similar periodical printed in Bombay usually contains special references to the cotton market and the textile industries.

The vernacular trade bulletins published and sold in some of the interior markets are frequently issued on one sheet daily. Their circulation is more or less limited to the localities in which they appear. In the Punjab, for instance, there are at least four such publications—two at Lyallpur*, one at Jaranwala† and one at Amritsar.‡ Situated in the midst of an important wheat producing area it is but natural that their main topic should be wheat. A similar publication giving market information about wheat is printed in Hapur in the United Provinces. Two local trade papers in Bombay Presidency—one at Poona and the other at Hubli—give market prices for the local types of wheat.

(4) *Post, telegraph and telephones*.—Most of the larger *arhatiyas* have their own correspondents and agents in the various markets with whom they are in constant touch by letters, telegrams or telephone as regards prices, crop and business conditions generally. Some have branch offices at important centres and a regular exchange of market information goes on daily. The postcard

*The Daily Business and the Tijarat.

†The Beopar Pattar.

‡The Beopar Samachar.

is probably the most common medium where time is not important. Many firms have printed postcards giving a list of commodities with blanks opposite each item. These are filled in with their appropriate prices daily or as occasion warrants and posted to clients. Orders to buy or sell are also transmitted by telegram or telephone. Codes, private or otherwise, are used only by a few of the larger merchants, *e.g.*, mills agents, etc. The European shippers use their own private codes.

(5) *Radio*.—The radio is a comparatively recent innovation and a number of traders have provided themselves with receiving sets to listen in to the commercial reports broadcast from Calcutta, Bombay, Delhi, etc. Market information percolates very slowly into the rural areas and an attempt is being made by the Delhi Station to remedy this by arranging village sets and giving daily broadcasts specially adapted to the needs of the cultivators. Under present conditions the broadcast can, however, only cover a limited radius. There is no reason to doubt that the scope of this feature will be very greatly enlarged when the new transmitting equipment at present contemplated is brought into operation.

Arising out of a recommendation by the Wheat Committee of the Imperial Council of Agricultural Research, the Agricultural Marketing Adviser to the Government of India has made arrangements to obtain the requisite material for a weekly broadcast talk from the Delhi Station on the prices, movement and stocks of wheat, etc., at important centres. A short market report is broadcast on Sunday evenings both in the vernacular and in English. This report is based on data supplied by trading associations and Chambers of Commerce at Karachi, Bombay, Calcutta, Lyallpur, Amritsar and Hapur, and represents the latest available information up to the closing of the previous day.

(6) *General*.—The difficulty which has been experienced in comparing prices, of which constant examples are to be seen daily in the commercial columns of the press and elsewhere, is due not only to the variation in the terms and conditions of contract in vogue in different markets but also to the different units and methods of quotation. In Karachi, for example, wheat is quoted per candy of 656 lb. In Bombay the unit is per cwt. (112 lb.) and in Calcutta quotations are based on the maund of which two are in force—the bazaar maund and the Imperial or railway maund. The former is 82-2/15 lb. and the latter 82-2/7 lb. In the Punjab the maund of 82-2/7 lb. is the normal unit of quotation in all the large markets.

In the United Provinces, however, quotations even in some of the important markets in the western districts are not always based on the same unit of weight. The maund of Chandausi is of 50 seers in contrast with the 40 seers of the Imperial or railway maund quoted at other centres. The existing system of price quotation is confusing in that wheat may also be rated at so many seers per rupee. Although this is the usual practice in the retail trade this method of quotation is used for transacting business in many wholesale markets, particularly in the east of the United Provinces, Bihar, Bengal and Bombay.

The commercial news page chosen at random of a typical daily such as the *Statesman* will be found to contain quotations based both on rupees, annas, pies per maund as well as seers per rupee. It is essential that price quotations should be readily comparable and this can only be achieved by standardising the system of quotation.

The maintenance of up-to-date price quotations and their dissemination to producers in the remotest parts is essential. A suitable system might be evolved somewhat on the following lines. The Central Office would be interested mainly in collecting and disseminating the rates and conditions as reported from some of the largest markets or focal points in each province or zone including those ruling at the local headquarters of the province, which in a number of cases is not a trade centre of any great importance for primary products, e.g., Poona, Lahore, Nagpur. This information could be transmitted to the centre either daily or weekly by telegram. The local marketing staff might be made responsible for collecting prices in local markets and for ensuring that the rates ruling at all markets, in particular the closing rates, were posted up so that when the cultivator brings in his produce he can see exactly how the market closed on the previous day. The rates in the key assembling markets might also be forwarded daily to the smaller local markets. It should be possible to reach these overnight as many of the small centres within the sphere of influence of the larger markets as are at a distance of not more than 20 or 30 miles as a rule.

INTER-CHAPTER THREE.

If growers are to get better prices for their wheat the first step is to ask what are the prices ruling in the various markets. Here again the answer is very much like Abracadabra. In Karachi, for example, wholesale prices are quoted in terms of rupees per candy (656 lb.), in Bombay per cwt. (112 lb.), in other places in maunds which may be 82-2/7 lb., and may be not. In some parts—and everywhere generally in the retail trade—the price is quoted in terms of seers (2.057 lb.) per rupee but the buying seer may in some cases be heavier than the selling seer. This gives rise to the anomaly whereby the retailer sells apparently at a lower price than he buys in the wholesale market. Clearly something must be done to put price quotations in all markets on a comparable basis.

After sorting out the mass of conflicting material collected in the course of this survey certain facts stand out quite clearly and may be briefly summarised as follows.

White wheats almost everywhere command a premium, generally about Re. 0|2|0 per maund over red wheats. Soft wheat (*pissi*) is at a discount of about 5 per cent. compared with hard wheat (*sharbat*). *Durums*, the hardest wheats of all, sometimes and in certain markets, particularly in Central and Southern India, sell at quite fantastically high premiums over other wheats, but more generally the premium amounts to between Re. 0|8|0 and Re. 0|12|0 per maund.

As between different markets, prices for the same kind of wheat differ naturally according to their distance from the producing centres. In all the more important markets, however, such as those at the ports of Karachi, Bombay and Calcutta and in the main up-country centres such as Amritsar, Lyallpur, Hapur and Muzaffarnagar, where there are organised trade

associations, the prices move very much in sympathy with one another but in many other markets where no associations exist prices appear to move in a disconnected way, up or down, independently of one another and of the main markets referred to. These highly irregular movements add appreciably to the risks and consequently to the costs of marketing and it is necessary that closer connection should be established between all the markets so as to synchronise movements in prices.

A great divergence in prices is similarly observed with regard to *durum* wheats. Their prices in different markets appear to have little or no relation with one another or with the price level of ordinary white wheats. In order to stabilise *durum* prices there is, therefore, need for an association to establish a *durum* wheat contract in Central or Southern India, say, either at Indore, Hyderabad or Bombay.

The most outstanding and probably the most serious factor from the growers' point of view is the seasonal depression in prices at harvest time. Year by year in some of the leading markets as the harvest reaches its height prices fall on an average by 19 per cent. It is useless to ask the grower to hold back his supplies until prices rise again. He must convert his crops into cash as they come along and if he does not take his wheat to market when the weather is good the difficulties of transport during the monsoon months would, in most cases, render this impossible. The solution is rather to be found in the provision of adequate and suitable storage accommodation and adequate "hedging" facilities at the key positions occupied by the more important assembling markets. That storage can be done with profit will become apparent in the subsequent chapter dealing with conservation.

It is often claimed that speculative trading and dealings in "futures" causes the seasonal depression

in prices to be greater than need be. This is not, however, borne out by the evidence which, indeed, seems to indicate that the " futures " markets have a stabilising effect on " ready " prices. The speculators, particularly on the more important grain exchanges in the producing areas, are apparently optimistic " bulls " and " futures " quotations generally stand at a premium over " ready " prices. It is not possible to ignore, however, the probable harmful effect on growers' prices at harvest time of the strong and prolonged " bearish " tendency of the July " future " at Karachi and the May " future " at Calcutta.

It is desirable that growers should be kept better informed of the course of prices. At present they depend very largely on hearsay and on reports received from the local *baniya* and their neighbours or others who have been to market. There are, however, two aspects of this problem. First, it is necessary to collect proper and correct information regarding prices and then to pass this on to the grower.

From a marketing point of view this survey shows that " official " prices are of no value. Prices published in the daily and trade press are not intelligible to the ordinary reader who may be unaware of the weight of the unit quoted or of the quality or amount of refraction on which the quotation is based. Merchants, as a rule, keep themselves in touch by means of post, telegraph or telephone, and daily prices both " ready " and " futures " can be obtained through the trade associations in the larger markets. It is only necessary that all the associations should observe the same standard of quality and a uniform system of price quotation. Steps in this direction are already being taken.

For smaller markets local arrangements should be made probably by establishing market committees whose function it would be to obtain and post up in the market

the daily prices, not only of that market but also of the larger wholesale market or markets with which it is directly connected.

Recent developments in the way of broadcasting market prices through village radio sets give rise to the hope that the cultivators will in the near future be brought into more up-to-date and closer contact with wheat prices.

CHAPTER IV—PREPARATION FOR MARKET.

The quality of the grain is largely influenced by the preliminary operations associated with the preparation of wheat for market, *vis.*, harvesting, threshing and winnowing. These operations may proceed slowly when the ryots are busy with the preparation of land for the ensuing *kharif* season and considerable quantities of grain may lie unprotected in the fields for two or three months. There is, therefore, always a risk of some of the produce being damaged by unseasonable rains. Winnowing is at times delayed if there are no favourable winds, or, if carried out in their absence, the proportion of impurities which remain in the wheat is higher.

A.—Harvesting.

The wheat crop is harvested only when it is fully ripe and reaping generally commences when all the green has gone out of the plant and the straw becomes yellow or brown below the ears of the grain. The methods of reaping adopted all over the country are primitive and almost uniform. The workers squat on their heels and cut the wheat close to the ground by hand by means of a saw-toothed sickle. In some parts of the United Provinces, however, a similar type of sickle but without dentation, known locally as "*hasya*" is used. In the Bombay Presidency, the Central Provinces and Hyderabad (Deccan) the plants are first uprooted and the earth sticking to the lower parts of the plant is removed by the sickle. Where this practice prevails it increases the proportion of dirt in the grain. For example, the maximum dirt content of the wheat grown in these three areas is higher than in any other province or State save in Rajputana (Appendix XXII). The maximum percentage found in the Central Provinces' samples was 7.49 per cent., in Bombay 9.96 per cent. and in Hyderabad 7.63 per cent. On the other hand, in the Punjab the maximum admixture of extraneous matter (oilseeds and other non-food grains apart) was on the whole less than $1\frac{1}{2}$ per cent. and the average a little more than .25 per cent.

Reaping is done by the farmer himself who may be assisted by members of his family, by borrowed or hired labour. In the case of small holdings the ryot generally depends on family labour. On larger holdings labour is either borrowed or hired as any delay would result in the wheat shedding. In the Canal Colonies tract of the Punjab, reapers are imported from the south-eastern districts of the province where the wheat area is less and the harvest earlier. In other districts hired labourers either men or women, are usually available on the spot, and apart from the nomadic tribes who may be engaged, there is no seasonal migratory movement of labour from one part of the country to another for harvesting.

The cost of reaping when hired labour is employed may be classified under the daily wage system or the contract (acreage) basis, both of which entail payment either in cash or in kind, generally the latter. In the major wheat producing provinces the position may be summed up approximately as follows, but it should be understood that the terms from village to village and from district to district vary according to custom.

Cost of reaping an acre.

Provinces.	On daily wages.			On contract.		
	Cash.	Kind.		Cash.	Kind.	
		Quantity.	Estimated value**.		Quantity.*	Estimated value.
	Rs. A. P.	Mds. Srs.	Rs. A. P.	Rs. A. P.		Rs. A. P.
1. Punjab ..	5 0 0	..	..	5 0 0	1/20	4 1 0
2. United Provinces.	1 14 0	0 12½ to 1 0	0 13 9 2 12 0	..	1/33 to 1/16	0 12 9 to 1 9 3
3. Bihar and Orissa.	..	..	..	..	1/8	3 15 6
4. Central Provinces.	.	0 12½	0 15 0	..	1/20 or 1/3 of seed rate or 14 seers.	0 12 0 to 1 0 0
5. Bombay ..	..	..	..	..	1/20	0 12 0
6. Sind ..	2 13 0	..	..	..	1/15 to 1/20	1 0 6 to 1 5 3
7. Delhi ..	1 11 6	.	..	..	1/16	1 8 0

It will be observed that there is a very wide range in the costs of reaping in different provinces. The high cost in the Punjab is particularly noticeable and is probably due to the dearth of local labour for handling such a large crop. When the wheat is reaped it is immediately tied into sheaves and stacked on the threshing floor which is usually nearby.

B.—Threshing.

Sometimes a small threshing floor may be specially prepared for the occasion in the field and after its purpose has been fulfilled it is ploughed over again. Common open sites wherever available in the vicinity of villages, are however generally utilised for threshing. The crop of the whole or a section of the village is threshed there. Such lands are not generally used for any other purpose. In other villages a suitable plot is selected each year for convenience either near the village or at some other suitable place. The floor is watered, beaten out level and plastered with a mixture of mud and cowdung

*Fractions indicate the proportion of the crop harvested.

**Value has been estimated by taking into account the average yields and the harvest prices in 1935. As wages in kind are customarily paid in the form of sheaves the value of *bhusa* is also included.



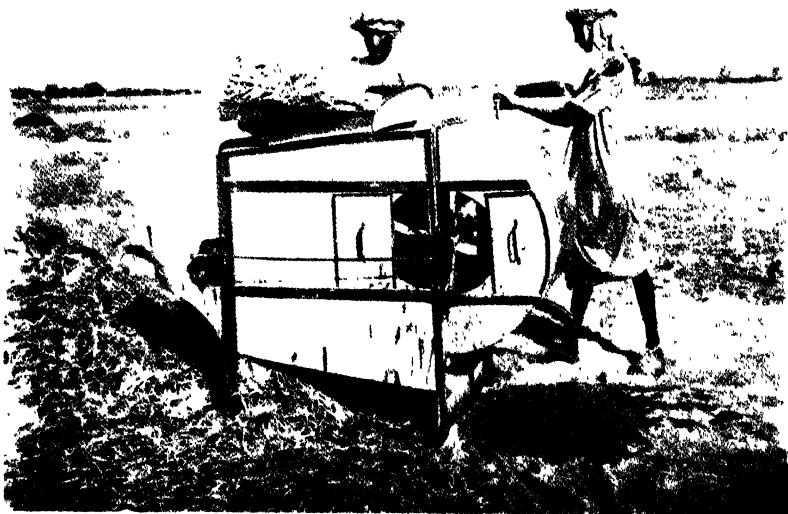
A CORNER OF A TYPICAL MANDI IN THE PUNJAB.
Notice the dirt and ordure on the floor in the foreground.



AN ARHATIYA'S SHOP IN A MANDI.



WINNOWING. A TYPICAL SCENE ON A FARM.



AN EXPERIMENTAL HAND WINNOWER USED ON A GOVERNMENT FARM IN THE PUNJAB.

to make the surface hold together. In threshing, the sheaves of cut wheat are first untied and scattered over the floor for the purpose of drying out.

The most common method of threshing is by a weighted wooden frame or beam, known as "*phalla*". This is yoked to a pair of bullocks and driven round and round over the sheaves until the combination of friction and weight has caused the grain to be separated from the ears. This treatment also breaks up the straw but after a time it affects even the surface of the threshing floor which tends to disintegrate releasing bits of earth, stones, etc., which become mixed with the grain.

Another method dispenses with the weighted beam. The bullocks alone are driven round and round over the wheat sheaves scattered on the threshing floor. The straw is broken into small pieces and the grains are separated when trodden under the bullock hoofs for a long time. This method is generally used by the ryot whose harvest is limited. Smaller lots of sheaves yielding about a maund or two of grain are threshed by hand. This is beaten with a stick to separate the grain from the ear. The jointed flail used in western countries is apparently not used in India. These operations are carried out mainly by the farmer himself using his own bullocks and assisted by members of his family. In rare cases only is hired labour employed. When this is done, the cost, for example, in the Punjab of threshing one acre of wheat in a day works out at Rs. 4-6-0 for three men and two pairs of bullocks. As soon as threshing is complete the grain is heaped up in the middle or corner of the threshing floor pending winnowing.

C.—Winnowing.

The methods observed in the chief producing areas are similar in all the main essentials. The first stage in winnowing is for the grain and broken straw to be tossed into the air by a wooden pitchfork. This allows the wind to carry away the broken straw, chaff and lighter impurities, while the grain and any heavy foreign matter present falls back on to the ground. Subsequently the grain which is still full of impurities is placed on a winnowing tray. This is lifted high above the winnower's head (see plate on page opposite) who frequently stands on a stool to gain height and the contents are slowly shaken out on to the ground allowing the wind to blow away the fine earth, dust and chaff and unthreshed heads of grain, while the wheat and the heavier impurities such as lumps of earth fall to the ground. Frequently there may be insufficient wind in which case the air is agitated by means of a blanket. Any heads of wheat not properly threshed are after separation again trodden under by the bullocks and re-winnowed. No further dressing takes place on the holding except in the Central Provinces where owing to the nature of the soil large particles of earth and pieces of stone remain in the wheat. Further the wheat in those parts is largely sown mixed with other crops and sieving is necessary to separate the different kinds. It is noteworthy that in the United Provinces and even in other parts of Northern India where a mixed crop is raised dressing is not usually practised on the farm but is done in the primary markets prior to sale (see plate facing page 153).

Winnowing operations are chiefly performed by the cultivator and his family but occasionally hired labour may also be employed, in which case the remuneration given is generally in kind. In the Punjab the rate of payment is $1\frac{1}{2}$ to 2 seers per maund of winnowed grain and at present values the cost of winnowing by hired labour is roughly Rs. 1-8-0 per acre.

It has already been observed that hired labour for reaping (*see* table on page 120) as well as for the subsequent operations of threshing and winnowing is generally paid in kind. An estimate based upon the rates of hire customarily paid in different areas indicates that about 500,000 tons or rather about 5 per cent. of the total Indian crop is disbursed at harvest time in the form of wages.

D.—Introduction of improved implements.

The Departments of Agriculture in the Punjab, Central Provinces and Bombay have tried to introduce labour saving machines to replace the existing primitive methods (*see* plate facing page 121). The scythe which long ago replaced the sickle in western countries and has since given place to the mechanical harvester, was tried out at Lyallpur but was rejected owing to the fact that the labourers did not like the upright working position which it required and also the subsequent bundling of the sheaves. Later bullock driven mechanical reapers were tried which proved inefficient over both irrigated and *barani* lands owing to the raised embankments or bunds of the former and the ridged surface of the soil on the latter. Threshing and winnowing machines were also tried in the Punjab but did not prove an unqualified success on account of the grains breaking and the straw (*bhusa*) being longer and stiffer than that produced under the traditional system. There has been some success in Sind in the introduction of a bullock-drawn threshing implement with saw-toothed wheels. A mechanical wheat thresher is a recent innovation in the Bombay Presidency (Southern Division) and a thresher and a winnower have been introduced in the Central Provinces. No material progress has so far been reported as regards the adoption of these machines by the ordinary cultivator. In the Punjab, power-driven and in Bombay hand-driven winnowing fans have been designed and are under experimental trial.

INTER-CHAPTER FOUR.

The first step in preparing the wheat for the market is harvesting. This is generally done by the hand sickle. Subsequent threshing is done by bullocks treading out the grain, and in winnowing the ryot generally depends on the winds of heaven.

Efforts have from time to time been made to wean the cultivator from his present primitive practices. Scythes have been tried but without success since the workers object to adopting an upright position. Mechanical harvesters and bullock driven mechanical reapers have been tried out in different districts but owing partly to technical difficulties they have rarely been found economic either on irrigated or *barani* lands.

The cost of reaping by hired labour which is usually paid for in kind represents about 5 to 6 per cent. of the crop. Threshing, in rare cases where hired labour is employed, works out to about Rs. 4|6|0 per acre and winnowing about Rs. 1|8|0.

It is a question whether there is any great necessity to try and alter or improve the present methods of preparing wheat for the market as practised by the cultivator at any rate till primary markets are better organised.

The presence of impurities such as other food grains, oil seeds, etc., is partly due to the custom of sowing mixed crops, partly to the stacking of barley, gram and other grains or seeds in close proximity to the wheat and partly also to the use of one and the same threshing floor for all varieties of crops. Even when thoroughly cleaned in the process of winnowing, dirt may later find its way in among the wheat before being marketed owing to the practice of covering the wheat with earth, etc., in store as a protection against weevil attack.

For sale on the internal market a large amount of trouble and labour has to be undertaken after the wheat leaves the hands of the producer, before it is sufficiently clean and fit for conversion into *ata* by the consumer or in the power *chakkis*. In almost every wheat market in India large numbers of labourers of both sexes are employed for the purpose of dressing or cleaning the wheat before it passes into the wholesale or retail trade, and scattered groups of workers may be seen attending to separate and individual heaps, both small and large, all over the market place. The first dressing having been completed and the larger impurities eliminated, further operations are performed with a winnowing tray for the removal of the smaller impurities, particularly where retail quantities are concerned and the buyer is the actual consumer. The screenings or residue from a heap, after it has been bagged, is also carefully re-winnowed by hand. The inconvenience and waste of time involved in these numerous operations at every stage is very considerable apart from the fact that the results achieved are often not commensurate with the amount of labour expended.

Where the wheat is destined for the export market shippers re-dress the grain at the port so far as is necessary. If barley is present in appreciable quantities in the wheat and if the price of barley is more than half the value of the wheat it may pay to have a special cleaning plant for removing the barley. For example, at Karachi until four or five years ago there was at least one elaborate cleaning and barley separating plant for wheat destined for the export trade. The fact that this machinery has now been dismantled is due to the decrease in exports and the irregularity of the trade as well as the difficulty of finding a market abroad for the barley with which the wheat formerly sent to Karachi from Sind and the south Punjab was often heavily adulterated.

For sale to roller mills the existing system of preparation as carried out on the holding appears to be adequate. These mills are equipped with suitable machinery for cleaning the grain and the barley or other grains extracted in the process are ground separately to be mixed in with the bran for stock feeding, and thereby the amount of loss is reduced. In regard to the dirt content this is usually discounted in the price when buying and, even if the wheat were as clean as a cultivator could possibly make it, it would still have to be washed in the process of conditioning prior to milling.

For the wholesale market the present methods pursued by the cultivators can generally make the wheat sufficiently clean to meet the terms and conditions of the contracts prevailing in the different markets. In fact, it would appear that the amount of dirt and other impurities present in the grain as put on the market is not infrequently due to the high percentage allowed in the contracts of different trade associations rather than to any shortcomings in the methods of preparation by the cultivators. In Lyallpur market for example, where the quality of the wheats specified in the local contract is high, (*i.e.*, only a small percentage of refraction is allowed) and where the terms are mutual, the wheat as normally delivered by the cultivators is much cleaner than in, say, Amritsar market where until very recently the local contract used to allow a high percentage of refraction and the terms were non-mutual so that anyone who delivered cleaner wheat of a higher quality than that required by the contract did not derive any benefit therefrom. As a result of an informal conference of representatives of trading associations and mills initiated by the Central Marketing Staff early in April 1936 a modified contract has lately been adopted at Amritsar which provides for the mutual adjustment of refraction.

The new basis has, however, not been long enough in operation to enable a fair comparison to be made with

the condition of the wheat arriving under the old non-mutual contract.

For the export market, for roller mills and for the general wholesale trade there seems no necessity to try to induce the cultivator to alter his present methods of preparing wheat for the market. Although, as will appear in a later chapter, there is ample scope for improving the cleanliness of the wheat in the cultivators' own interest, the present methods are in the main adequate except in the case of the wheat purchased by consumers direct in small retail quantities or for crushing in the power *chakkis*. This constitutes, however, by far the greater proportion of the wheat used in the internal market and amounts probably to between 4 and 5 million tons in all, 2½ millions of which are crushed in the power *chakkis*. As has already been observed this wheat is dressed and redressed at every stage but the methods employed are primitive and although fairly efficient after their own fashion the wheat when finally ground still contains a certain amount of dirt and other admixture. It seems desirable that this should be eliminated. The wheat to be consumed in this way should, if possible, be made as clean as that used for producing flour in the roller mills. This can only be done if, as well as using sieves and separators, the wheat is also subjected to some form of washing. This, however, does not seem to be an operation which could be carried out by the cultivator but could be more properly done at the large wholesale assembling centres in the producing areas by those enterprising enough to instal a simple plant necessary for the purpose.

Experiments are at present being carried out to see how far there is a demand for this special type of clean wheat and if justified by the circumstances it seems possible that the conditioning plant attached to roller mills which have been closed down might be suitably used for this purpose.

CHAPTER V.—ASSEMBLING.

In India, a country of small holdings, the assembling of produce from the fields constitutes one of the main marketing services. This stage of the marketing system is important since it is at this point that the grower converts his crop into cash.

A.—Methods of assembling.

Assembling in this country is done by a number of agencies, viz. :—

- (1) Growers, landlords or cultivators who bring their own wheat for disposal to the market.
- (2) Cultivators who collect the produce of other growers.
- (3) Landlords collecting the produce of their tenants.
- (4) Village *baniyas* (shop-keepers).
- (5) Itinerant dealers and petty merchants who move from village to village.
- (6) *Kachcha arhatiyas* or small commission agents in the primary or assembling markets.
- (7) Co-operative commission shops or sale societies.
- (8) *Pakka arhatiyas* or large commission agents and wholesale merchants and mills.

(1) BY GROWERS.

As a rule the cultivator likes to market his crop himself, but in actual practice the opportunity of doing so varies in different tracts. Sometimes the need for ready cash induces him to sell off a portion of his crop to the village *baniya* or to one or other of the itinerant dealers, who are constantly on the move during the harvest period. Agricultural operations are also a governing factor. In irrigated tracts in the west of the United Provinces, for instance, where cotton or fodder crops are sown just after the harvesting of the *rabi* or spring crops the grower has practically no time to go personally to the market. Complicated market practices, lack of transportation facilities and the holding of quantities too small to justify carrying them to market are some of the factors which cause cultivators to sell their wheat in the village.

During this enquiry it was found in the Punjab that about four-fifths of the wheat crop of the districts of Jullundur, Ludhiana and Montgomery, where means of communication and transport are well developed and the marketable surpluses considerable, are sold by the *zamindars* or cultivators directly in the assembling markets. This confirms the results of the investigations* conducted by the Punjab Board of Economic Inquiry a few years ago in several important markets of the Ferozepur and Lyallpur districts, which

*Finance and Marketing of Cultivators' Wheat in the Punjab. Publication No. 38, Board of Economic Inquiry, Punjab, page 18.

showed that the proportion of sales by growers was more than three-fourths. Where opposite conditions exist as in the Attock district, in Northern Punjab, the proportion falls to an insignificant level.

In the west of the United Provinces about one-third of the local surplus is estimated to be taken to assembling markets by the cultivators themselves. In the eastern districts, however, where rice predominates the proportion is much less owing to the small quantities involved and the lack of means of transport.

In rural Delhi enquiries made during this survey showed that only about one-third of the local crop is normally marketed by the growers themselves. In the Central Provinces about two-thirds of the crop is marketed by the *kisans* or cultivators in a "*ganj*" or assembling centre while those, who have only small quantities for disposal sell to the village merchants at the nearest village or on their own holdings.

In the southern districts of Bijapur, Dharwar, and Belgaum in the Bombay Presidency where a fair amount of wheat is grown, roughly three-fourths of the harvest is taken by the cultivators to the nearest assembling markets. On the other hand in the Ahmednagar and Nasik districts further north more than three-fourths are handled by merchants.

In Baroda not more than about one-third of the sales of the wheat crop are made direct to the village *baniya*. It was also apparent that there was an increasing tendency to take the wheat to the nearest market centre rather than dispose of it in the village or straight off the threshing floor.

(2) BY CULTIVATORS WHO COLLECT THE PRODUCE OF OTHER GROWERS.

These operate mainly in the Punjab, Central Provinces and United Provinces but the amount of wheat thus handled is not large. This class of cultivator is generally a small holder with a certain amount of business ability who possesses transport which he may ply for hire. By frequent visits to markets he becomes fairly well acquainted with local trade practices. After his own crops have been disposed of, he employs his time in buying and collecting the crops of other cultivators and is thus able to supplement the small income which he earns by hiring out his cart.

(3) BY LANDLORDS.

Landlords play an important part in the assembling of wheat mainly in the Punjab, the United Provinces, the Central Provinces and Sind. Ever since the recent economic depression set in, the payment of rents in kind has become a common practice in the United Provinces owing to the prevalence of low agricultural prices and the consequent difficulties experienced in the realisation of rents in the form of cash. Besides bringing to the market their own share of the produce, received as rent, landlords also collect wheat from their tenants in lieu of seed and maintenance advances.

(4) BY VILLAGE *baniya*.

The village *baniya* who is usually a petty shop-keeper, provision merchant, money-lender and trader combined, is a very important assembling agency and functions in the villages throughout the country. Most of the wheat and other produce which finds its way into the hands of the *baniya* from cultivators is in repayment of loans which may have been either in cash or kind, but the quantity or proportion varies from locality to locality within the same province. One-half of the Delhi crop is estimated to be assembled primarily by this agency. In Bihar and Orissa the proportion is reckoned to be as high as four-fifths while in the Central Provinces it is about two-fifths. Fully three-fourths of the produce marketed in some districts of the Bombay Presidency is first handled by the *baniya*. In the Punjab, however, owing largely to the better facilities for communications and marketing, the proportion of sales in the markets by the *baniya* was found to be about one-fourth only. It has also been observed that the proportion tends to increase where the village is at some considerable distance from a market.

From such information as it has been possible to gather from contact with actual conditions it is estimated that not less than one and probably not more than two-fifths of the total Indian crop passes through the hands of the village *baniya* on its way to the larger assembling centres. The proportion of his collection of wheat retained by the *baniya* for village consumption depends upon his financial position. If he is financed by an *arhatiya* or large wholesale dealer in a nearby town, or by any other agency he may have to dispose of most of his stock in liquidation of his accounts through the *arhatiya* soon after collection.

(5) BY ITINERANT DEALERS.

The itinerant dealer is usually a petty merchant and generally carries on his trade in several villages buying wheat and transporting it to the nearest wholesale market or assembling centre usually in hired bullock carts. He keeps himself in touch with the prices ruling in nearby markets and sometimes with the values obtaining at some of the main centres in more distant parts and even in other provinces. This class of trader is mostly found in the Punjab, the United Provinces and in Bihar.

In the Punjab *ghumars** and *telis*† are important factors in assembling produce. The former utilise donkeys for transportation but the latter use bullocks as pack animals. It has been observed that this type of trader is particularly active when wheat rates are on the rise. Their purchases are effected through local brokers or weighmen, who, in certain villages, hold a monopoly for the negotiation of all sales of local produce and charge Re. 0-0-3 per maund from buyer as well as seller. These monopolies are auctioned by the village headmen each year and seem to have originated in olden times as a means of building up a common fund in the village

*A community primarily engaged in making pottery.

†Persons engaged in crushing oilseeds by *ghanis*.

for religious purposes or for providing social amenities. The practice, however, appears to be rare outside the Punjab.

Sometimes these itinerant dealers, if known to the seller or the intermediary, pay the grower for their purchases three or four days after they, in their turn, have disposed of their stock at an adjacent market. Investigations conducted by the Board of Economic Inquiry in the Ferozepur and Lyallpur districts show that approximately one-twelfth and two-fifths respectively of the sales by growers in villages in these two areas were made on a cash basis and that the majority of the wheat so disposed of was bought by itinerant dealers. In Northern Punjab the proportion of cash sales was about one-tenth. In Delhi itinerant merchants appear to buy about one-fifth of the total amount of locally grown wheat marketed in the province. In other provinces this proportion varies so considerably and the evidence afforded by traders is so conflicting that any estimate of quantities might be completely misleading.

(6) BY *kachcha arhatiyas* OR SMALL COMMISSION AGENTS.

There are two types of *arhatiyas** or commission agents—*kachcha arhatiyas* and *pakka arhatiyas*. *Kachcha arhatiyas* are almost always persons of small capital whose sphere of activity is purely local and who act mainly as middlemen or intermediaries between the primary producer or seller and the buyer in the large wholesale markets. In this respect they may be likened to *dalals* or brokers but they are more than just purely brokers for they may themselves be buyers on their own account. In some instances, as in Bombay and Hyderabad (Deccan), the *kachcha arhatiyas* finance the producer and village *baniya* mainly on condition that the latter sells his goods through them. It is interesting to observe that although there is no compulsion to utilise the services of an *arhatiya* in any market in India, direct negotiations are very rarely entered into between buyer and seller and the old custom of dealing through a commission agent is the general rule.

(7) BY CO-OPERATIVE COMMISSION SHOPS OR SALE SOCIETIES.

The functions of these organisations are in the main similar to those of the *arhatiyas* or commission agents already described. This particular branch of the co-operative movement appears to have developed to a greater extent in the Punjab than elsewhere and there were, in 1935, twenty-one shops at twenty-one markets of which 17 were located in the Canal Colony districts of Lyallpur, Montgomery, Multan, Sargodha, Sheikhupura and Gujranwala. Of the remainder two were in the Ferozepore district and one each in the Sialkot and Gurdaspur districts. These shops are registered under the Co-operative Societies Act, 1912—the first being registered in 1919 at Lyallpur. The members consist of land owners or cultivators, mortgagees or lease holders of agricultural lands or registered Co-operative Societies. In 1935 there were 3,313 individuals and 1,100 societies affiliated to these 21 commission shops but the extent to which they availed themselves of the facilities offered was almost

*In the Central Provinces, Bombay and the Deccan generally the *arhatiya* is known as *adatiya* and his commission as *adat*.

infinitesimal. The capital of these co-operative commission shops consists of the value of the shares sold, deposits from members, deposits on loans from non-members and profits realised. With the exception of one institution at Arifwala, which has recently purchased its own premises for Rs. 6,000, all these shops occupy rented accommodation situated within the purlieu of the markets.

The policy and general management of co-operative commission shops is vested in the hands of committees which form their own directorate and are annually elected at a general meeting. The actual day-to-day business of each shop is however conducted by a manager who is generally a salaried employee. In order to induce the manager to take a more lively interest in the development and welfare of the institution, the remunerations of the managers of the shops at Gujranwala and Chuharkana respectively have recently been fixed at 40 per cent. and 50 per cent. of the net income as an experimental measure.

The total quantity and value of produce sold through all the co-operative shops in the Punjab during 1932-33 and 1933-34* is given below :—

					Tons of produce sold.	Value in Rs.
1932-33	..	.	..	..	21,900	18,61,154
1933-34	..	..	..	..	25,550	18,95,289

In addition to the above-mentioned institutions mention should be made of "The Okara Zemindars' Co-operative Sales Society Limited", Okara (Montgomery district), registered under the same Act. Its membership consists of one credit sale society, three Government farms and 29 large landlords and its functions are more or less the same as those of the co-operative commission shops. It serves a radius of about 12 miles round the important market town of Okara, some 80 miles south east of Lahore, on the North-Western Railway main line between the Punjab capital and Karachi. Its office, a double storeyed building, is situated inside the market and faces the square. Members' total sales for the year 1934-35 amounted to 231,349 maunds or about 8,500 tons valued at Rs. 10,43,385 of which, wheat represented some 4,450 tons or 52 per cent. of the total. The value of the wheat sold was Rs. 2,68,409. Sales on behalf of non-members during the same period amounted to less than 500 tons valued at Rs. 55,776 ; in this case separate accounts for wheat were not available. It is claimed with justification that about 14 per cent. of the total wheat produced in the area served by the Okara market passed through the society's hands during the year. It is noteworthy that the greater proportion of the produce grown on the Military Farm, and the Coleyana Estate Ltd., Okara, who are both members of the society, was sold to the Agricultural Department. The total production of these two farms was 3,309 tons in 1933-34, 2,963 in 1934-35 and 2,595 in 1935-36.

In the Bombay Presidency there are a large number of co-operative sale organisations but most of these deal chiefly in cotton

*1934-35 figures not available.

and some in groundnuts. Apparently only a very few, e.g., the societies at Dhulia and Jalgaon, handled wheat which in all was worth about Rs. 55,000 during 1934-35.

In Sind there is only one co-operative sale institution, viz., the Co-operative Grain Sale Society at Shikarpur. During 1935 it had 225 members, of whom about two-thirds were producers. It functions like the Punjab co-operative commission shops except that the managing director who has been responsible for the conduct of business since the inception of the society, is not a salaried employee, his remuneration being a half share of the annual net profits. In 1934 this society handled 784,860 maunds or 28,800 tons of all kinds of grains of the value of Rs. 21,61,138. It also takes a limited part in the distribution of seed wheat obtained from the agricultural department, details of which are given in Chapter XI.

(8) By *pakka arhatiyas*, WHOLESALE MERCHANTS AND MILLS.

Pakka arhatiyas occupy a very conspicuous place in the marketing organisations of India. These are usually firms of some substance dealing in grains, oilseeds, cotton and other primary produce either as agency houses or on their own account. Many also have branches in other markets throughout India. By virtue of their position and the facilities for finance which they are usually able to command, the *pakka arhatiyas* provide the necessary link between distant buyers and sellers and their own markets. They also help in the assembling of produce by financing the operations of the *kachcha arhatiya* and other small traders. *Pakka arhatiyas* form the main channels of distribution, are often the chief holders of stocks and operate as large wholesalers on their own account.

Many of the large flour mills employ *pakka arhatiyas* as agents for the purchase of their requirements of wheat and also, in certain cases, for the distribution of their manufactured products. The financing of the trade generally is also a function performed by many of the larger *pakka arhatiyas* (see later).

In important industrial centres such as Calcutta, Bombay, Cawnpore, Ahmedabad and Delhi, where there are a number of large roller mills, the wheat required for milling is imported either through the mills' *arhatiyas* or the mills' own buying organisations in producing centres. Alternatively purchases may be made from local stock-holders such as *pakka arhatiyas* or wholesale merchants.

As already mentioned *pakka arhatiyas** do not generally buy from the primary producer direct except during the heaviest rush of post-harvest arrivals. In Sind it was observed that a fair proportion of the crop which finds its way down to Karachi is bought directly from the grower by the agents of the large Karachi merchants who ship grain to Calcutta or Bombay. These firms usually send their own agents to the interior between April and September and it has been estimated that about three-fourths of their purchases are

**Kachcha pakka arhatiyas*.—It is not unusual for both the operations of buying and selling on commission to be undertaken by one concern. A commission agent who combines these two functions is commonly known as a *kachcha pakka arhatiya*.

made directly from the producer. Daily buying limits and other instructions are received by telegram from their head offices and purchases are generally assembled at the nearest convenient railway station. On occasions these agents also buy through the local *arhatiyas* and merchants on commission basis.

The number of wholesale traders operating in wheat throughout India must run to many thousands. For example, in Delhi alone there were about 200 *arhatiyas* of all types in 1935, while in the Punjab the number of *arhatiyas* in 42 important markets out of a total of 117 was 1,781. On this basis the total number of *arhatiyas*' establishments in this province can hardly be less than 4,000.

(9) COMPARISON OF DIFFERENT ASSEMBLING AGENCIES.

Although the grower who disposes of his crop directly in the wholesale market may be able to secure the market rate, the charges which he has to pay are almost invariably higher than those paid by experienced sellers such as village merchants. In markets where charges are payable in kind, the customary deductions are not actually weighed and the cultivator is mulcted of a somewhat larger allowance. The *arhatiya*'s commission is also always higher for the small grower because the village merchants and others whose turnover is greater, are usually able to secure favourable terms often as low as half of the ordinary rate charged to cultivators. The allowance for *karda* (see later)—nominally a fixed deduction to allow for the supposed average impurity content of the goods tendered for sale—charged from the cultivator-seller is higher than that charged from the more astute village merchants and weights and measures are usually more easily manipulated against the grower.

Enquiries in the comparatively well organised markets of Ilapur and Ghaziabad, where almost all the market charges are payable in cash, showed that the cultivators ordinarily pay half as much again, as the charges paid by the larger village merchants. In the Punjab markets, conditions are very similar, but in the eastern markets of the United Provinces and Bihar the cultivators have to pay anything from one and a half to twice as much as the average merchant.

In the case of the cultivators collecting the produce of their fellow growers and of landlords assembling their tenants' produce conditions are very similar although the extent of their operations and their better acquaintance with the market enables them to effect small economies in the allowance for refraction and in other charges in kind and in weighment.

From the point of view of the grower these agencies provide a useful service, particularly for those who have only small quantities to sell or who do not possess adequate transport facilities. The price offered to the small grower by the cultivator-trader, usually after protracted bargaining, has on enquiry proved to be about a quarter of a seer per rupee or three-fourths of one per cent. less than the current wholesale market rate, after making due allowance for all the incidental charges. It may be observed, however, that these cultivators and landlords execute more than three-fourths of their

sales during the three months following the harvest, at a time when prices are invariably low.

The village *baniya* and the itinerant dealers who collect a considerable portion of the wheat crop throughout the country, are experienced traders and have fixed arrangements with certain *arhatiyas* in regard to reduced rates of commission, etc. For this reason they are in a better position to pay higher prices to the cultivator than those offered by the assembling agencies just referred to. It is reported also in the Punjab that cultivators indebted to the *baniyas*, for example, frequently obtain a fair price for their produce, and sometimes even more than others, since their creditors are anxious to obtain repayment of outstanding loans and to collect some stock-in-trade for subsequent business.

It is estimated that unlike the produce handled by cultivators about three-fourths of the wheat collected by the village *baniya* is retained by him and utilised in the village or sold in an adjacent market during the off-season. Only one-fourth is passed on immediately. To this extent, therefore, the *baniya* constitutes a steadying factor in the adjustment of supply and demand.

In the Punjab which has by far the largest number of co-operative shops in India dealing with wheat, the total quantity of all types of grains (including wheat) handled annually ranges between 25,000 and 30,000 tons. Taking as a basis the proportion of wheat handled by the Okara Zemindars' Co-operative Society, the amount of wheat handled annually by all the societies cannot exceed 15 or 16 thousand tons. This is a very small volume of trade and represents only about one-half of one per cent. of the average wheat crop of the Punjab. Like other *arhatiyas'* shops the primary function of these co-operative institutions is to arrange for the assembling and sale on commission of produce brought by members or non-members. The charges levied vary from place to place according to local market practices but they are usually less than those of the other commission agents' shops. For example, at Arifwala the total charges made by the co-operative shop, on the member and non-member sellers are Re. 1-9-6 and Re. 1-13-6 per hundred rupees respectively, while the local *arhatiyas* charge as much as Rs. 2-2-3. It is claimed that, although their trade is small, these co-operative shops in the Punjab have proved beneficial in that they have by competition forced down the market charges of other *arhatiyas*. Besides operating at a reduced scale of market charges the co-operative commission shops are used by the agricultural department as a means for the distribution of pure or improved varieties of seed wheat.

B.—Markets.*

In ordinary parlance, a market includes any place where persons assemble for the sale of, or for the purpose of exposing for sale, articles intended for satisfying human wants whatsoever, with or without the consent of the owner of such a place. The market place

*Markets and Fairs will be more fully dealt with in a subsequent report. Here they are discussed in relation to the marketing of wheat only.

may be specially designed for its purpose, typical examples being the *mandis* of the Canal Colonies in the Punjab. It may, on the other hand, be a locality—a piece of waste ground, a street, the road side or any other place which by long custom has become a centre for trading. In India, the markets as a rule, have not been established according to each commodity. A number of commodities may be handled in the same market.

The markets may be classified into the following three main groups :—

- | | |
|---|---|
| (1) Primary village markets—(periodical markets). | These include mostly <i>penths</i> , <i>hats</i> , <i>shandies</i> and fairs which may function as produce assembling and general retail distribution markets. |
| (2) Secondary markets—(daily markets). | These include <i>mandis</i> (regular wholesale markets in a standing market place) which, in producing centres, function as assembling markets—in consuming centres, as distributive markets. Retail markets and bazaars specialising in the sale of agricultural produce might also be grouped under this. |
| (3) Terminal markets—("ready" and "futures" markets). | These may include produce exchanges organised under the auspices of trade associations and operating in connection with (a) export trade and (b) internal trade. |

Markets may be held daily or periodically at fixed intervals. In the daily markets, which are by far the most important as regards the volume of trade in wheat, business is done every day except on such religious occasions and public holidays as are observed by the trading community. All the main centres of trade have daily markets. Periodical markets concerned in the marketing of wheat are mainly found in Bihar, Bengal, United Provinces, Central and Southern India. In the Punjab and North-West Frontier Province they are a normal feature in the marketing of cattle only.

(1) VILLAGE MARKETS, *shandies*, *penths* AND *hats*.

The most common type of periodical market is the weekly bazaar known as such in Central India after the day of the week on which it is held, as a *shandy* in Southern India, as a *hat* in Bengal and as a *hat* or *penth* in the United Provinces and Bihar and Orissa. This type of market may be held once, twice or even thrice a week. Their existence is due to the nature of certain rural areas in which the peasants are cut off from the towns on account of defective communications and who live in rural isolation. In Bengal and the adjacent parts of Bihar, United Provinces and Assam for example, village settlements are scattered and consequently the concentration of a trading element is absent. These conditions favour the periodical market system under which itinerant traders are brought to serve as a link between the peasant and his market. These markets are regularly attended by such traders and a large proportion of the agricultural produce brought in by growers finds its way into the hands of these people. In the areas of intensive cultivation of wheat the concentrated village settlement usually predominates and in these parts the periodical markets, when held, are centres of retail trade only. At *shandies* and *hats* a wide range of articles of domestic

consumption is always available for sale, *e.g.*, food grains, oilseeds, fruits, vegetables, tobacco, spices, *gur* (unrefined sugar), provisions, cloth, silver, hardware, trinkets, etc.

In addition to being a place of trade the periodical market is often an important feature in the social life of the rural community. As a rule the days on which the markets are held are chosen with a view to avoid clashing with one another so that itinerant traders can make the rounds of each market. Periodical markets are usually held in the open or in groves by road-sides in important localities situated centrally. They may have semi-permanent sheds with thatched or tiled roofing and beaten earth flooring as in Assam, Bengal, Bihar and Orissa, and the United Provinces. In certain parts, however, only a few permanent shops exist for retailing articles of common use in the villages such as kerosene oil, salt, pulses, *gur*, sweets, *bidis*, betelnuts, etc. Proximity to a drinking water well is a general feature of such markets.

Melas or fairs.—In addition to these periodical village markets there are quite a large number of fairs associated with important religious festivals where considerable quantities of agricultural produce change hands. At Karauli, in Rajputana, for example, a large volume of business is transacted during the *Shiv Ratri mela* which lasts for about a fortnight and the State exempts commodities handled at the *mela* from the normal customs dues. The commodities sold in this fair are cattle, cloth and groceries. In the larger *melas* local authorities frequently make special arrangements regarding the land, layout and accommodation for those attending.

(2) SECONDARY MARKETS.

Many of the older inland markets which grew up during the last century consist of shops arranged on both sides of a road (*bazaar*). Examples of these are to be seen throughout the United Provinces, Central India, Bombay and Bihar where they are known as *golas*. In the old-established markets at Cawnpore and elsewhere the pavements in front of the shops may be 40 or 50 feet wide. On these pavements the produce is exhibited for sale in heaps of varying sizes. Cleaning and weighing of wheat and other manipulations also take place there under the eyes of the *arhatiyas*. The shops resemble barracks with raised brick and cement platforms and split bamboo and tiled roofs. There is an open space in front of the shops where the produce is assembled before it is taken over by the *goladar*.

There are certain objectionable features associated with these older markets. For example, the situation of the shops on a public thoroughfare, and with inadequate open space frequently precludes all attempts at handling or cleaning the produce on the spot without impeding and disorganising traffic. Where these conditions prevail a piece of waste land or unoccupied ground on the outskirts of the town is often used for parking carts and pack animals bringing produce from the villages. Buyers, brokers and other members of the trading community proceed to this place, generally in the forenoon, and after the day's bargaining has been concluded the various lots which have changed hands are taken by the sellers to the buyers'

godowns for delivery. If disputes occur, as they often do,—particularly over the terms of refraction (*karda*)—the seller is placed at a disadvantage as it is usually late in the day when deliveries are taken. In the event of the seller disagreeing with the allowance insisted on by the buyer or his *arhatiya* it is very difficult for him to remove his goods, find accommodation for himself and his animals during the night and re-offer his produce at the next day's market. At other places where markets are congested numbers of *arhatiyas* whose business premises are in the town itself, have for convenience built godowns or store-houses outside the town close to the place where the village carts assemble. At Cawnpore, for instance, the cultivator-sellers are required, by long usage, to give delivery at the buyer's godowns which may in some cases be three, four or even five miles away from the locality where the carts assemble. The bargain having been concluded the *kachcha arhatiya* sends his weighmen along with one or more labourers, often women, to accompany the cart to the buyer's premises. Should the buyer disapprove the quality of the purchase and demand a greater allowance for refraction than had been provisionally settled when the bargain was originally struck the cultivator has little option but to agree, as, having wasted the greater portion of the day and proceeded for a considerable distance, it would be well-nigh impossible for him to return in time to the market, and he must needs wait till next day to sell his produce.

In contrast with these markets which appear to have just "happened" the modern *mandis* of the Punjab and Western United Provinces where wheat, other food grains, oilseeds and cotton are sold in the same market, and the regulated cotton markets established in Bombay, Berar (Central Provinces), Hyderabad and a few other Indian States, have some semblance of order and system. The general classification under which the markets have been grouped does not entirely apply to many of the markets in Northern India. It is difficult to draw a line of distinction between these various classes in the Punjab and in many parts of the United Provinces. At most, the distinction is one of degree and in many cases it is impossible to differentiate. There is, for example, no central market in the Punjab which is not also a primary market.

The *mandis* of Northern India as a rule are regular wholesale markets, grain being the main produce handled. They are a comparatively new feature and date back not more than 40 or 50 years. In the Punjab, for example, there are 117 markets of which 77 are municipalities, 25 small towns, and 15 notified areas. All have telegraph and postal facilities and 31 markets are also on the telephone system. These *mandis* vary in size. In some cases the area enclosed may be as much as four or five acres, in others a few hundred square yards. They are almost invariably built in the form of a square, each side of the quadrangle having a gateway, and are generally situated within easy reach of the railway station. Normally these markets are enclosed by buildings composed of the shops, houses, etc., of the dealers and commission agents on the three or four sides of the quadrangle, a wide brick pavement being provided in front of the rows of the shops for unloading, sampling, cleaning, weighing and bagging of the grain and other produce coming into the market. In

front of the pavement, there is occasionally a metalled road sufficiently wide for the parking of carts but this is by no means the rule and the centre or enclosed area is generally *kachcha*, i.e., the ground being levelled off, without any top-dressing of stone or flags. In the dry season the *mandis* are, in consequence, very dusty and in the monsoon the water does not always drain off rapidly, large pools being formed in the hollows. Within the quadrangle there may be one or two wells for watering animals and a few trees for shade.

As soon as the producer or petty merchant brings a cart load of wheat into the *mandi* he makes for the shop of the *kachcha arhatiya* with whom he generally deals. His cart is parked as near to the shop as possible and the goods are either left in the cart or dumped and exposed for sale on the pavement. In most cases the cleaning or manipulation of the wheat, prior to delivery, takes place on the pavement or plinth in front of the *arhatiya's* shop which consists of two storeys as a rule (*see* plate facing page 120). On the ground floor facing the front pavement is a verandah. Behind the verandah are one or two rooms in which a portion of floor is raised and used as office by the *arhatiya*. The back rooms may look on to a small enclosed courtyard and the accommodation at the rear of the house is generally used for storing agricultural produce. The *arhatiya* and his family often live over the shop (*see* plate facing page 120).

The efficiency of a market lies mainly in the trading conveniences and facilities which it provides for the speedy determination of prices—which should be uniform for the same quality of produce—and for the easy and economical handling of the goods brought into it. In those markets where the shops and godowns of both sellers and buyers, are situated in the heart of the city or town, or are far from the railway stations or docks, the costs of assembling and distribution are relatively high. In addition, the inconvenience caused to the trading public may be considerable and the conditions are such as to foster malpractices on the part of less reputable traders. Further the weighmen and other labourers who would, if the marketing were centralised, be able to cope with many carts daily, are unable to handle more than a few. Some one obviously has to pay for this waste of time and effort and, as will be seen from the comparative list of market charges given later, the producer-seller bears the brunt of the heavier charges in the badly organised markets.

The markets of the Punjab Canal colonies, similar markets in the west of the United Provinces and a few types of *gunj* and market premises maintained by local authorities and market committees in the Central Provinces and Berar are a distinct improvement over the old type.

(3) TERMINAL MARKETS.

The chief functions of the port markets are concerned with distribution and are more suitably dealt with later. They may, however, for convenience, be briefly referred to here. Wheat arrives at the ports by rail or in bags and is stored temporarily in large godowns or sheds or warehouses owned by the port authorities in close proximity to the docks. If the goods are destined for consumption locally they are often removed to private godowns near the docks and railway



THE INTERIOR OF A *BANDHA* (C. P.).



FILLED *BANDHAS* WITH CONICAL MUD TOPS (C. P.).

Facing page 139]



TRADING HALL IN THE NEW BUILDING PUT UP BY THE KARACHI INDIAN MERCHANTS ASSOCIATION

goods yards. The shops and offices of the merchants are not necessarily so situated as to be near their stocks.

At Karachi the merchants' shops are located in the neighbourhood of Bunder Road one of the main arteries of that city while their stocks are usually at the Thole Produce Yard a mile or so away, or at Kiamari, three miles off. Until recently the common meeting ground in the mornings used to be a small public park but since the Karachi Indian Merchants' Association has incorporated a commodious produce exchange hall in its new building (*see* plate on the opposite page) a much more satisfactory market now exists for the conduct of spot and forward transactions. However, the volume of business done over the telephone in Karachi is probably in excess of the amount of business actually transacted by personal contact.

In Bombay the produce business is not centred in any one place. There are five markets in which grain and oilseeds are traded. The spot market is concentrated round Dana Bunder quite close to the docks in large public warehouses and in private godowns. Nearby are the premises of the Grain Merchants' Association, one of the oldest institutions of its kind in India having been founded some fifty years ago. Primarily a spot market, it offers facilities for hedging transactions, particularly for oilseeds. Further away at Kalbadevi the Marwadi Chamber of Commerce is a controlling factor in the "futures" trade in wheat (and linseed). This association has no trading hall at present. Its members and brokers congregate at the premises of the Grain and Seeds Brokers' Association, a few hundred yards off, and trading takes place there. This has long been recognised as an unsatisfactory arrangement as apart from lack of control over trading hours, which are officially 11-30 A.M. to 5-30 P.M. and from 8 P.M. to 10 P.M. the trading space is very cramped resulting in an overflow on to the street causing inconvenience and obstruction to the public. A new building nearby is now under construction which it is hoped will be completed in 1937. This will provide ample facilities for a trading ring and for the accommodation of members' offices, etc., somewhat on the lines of the Karachi Indian Merchants Association's new building. The Seeds Traders' Association handles oilseeds only and its functioning will be discussed in another report.

In Calcutta, a large proportion of local stocks of wheat are stored at Kidderpore in the Port Commissioners' godowns adjacent to the docks some 4 or 5 miles from the heart of the business quarter. At Howrah, the main railway terminus of the East Indian Railway, the Railway company has also provided a shed with corrugated iron roofs and cement floors which is used as a Grain Market to which merchants and brokers belonging to the Indian Produce Association are supposed to be allowed free admission. Actually, however, any trader may enter the market. Brokers in possession of the railway receipts are entitled to draw a sample of about $\frac{1}{4}$ seer from the relative consignments on the basis of which ready transactions are made. Rates which vary according to the point of delivery are settled under the *purdah* or cover system. Brokers are not allowed to remove the samples, but have to leave them in the shed for collection by the railway staff. These samples are periodically auctioned on

behalf of the railway by a local firm of auctioneers and the proceeds credited to the railway. The hours of business in this market are from 4 P.M. to 5-30 P.M. The Calcutta Grain, Rice and Seeds Association which is composed of about 180 members—mostly brokers—offers facilities for “futures” trading in wheat and linseed only. As at the majority of other exchanges the actual amount of wheat which changes hands in this association forms a very small proportion of the total volume of trading. Owing to the inconvenient distances separating the offices or shops of the merchants, business is mainly transacted over the telephone. There is a similar organisation known as the Indian Produce Association with a large membership of grain and seed merchants of the Bara Bazaar locality in Calcutta. Unlike the Calcutta Grain, Rice and Seeds Association no actual transactions take place under the auspices of the Indian Produce Association. Business is transacted between members through brokers at the East Indian Railway goods shed in the Howrah Grain market. No records of business transactions are kept by this Association, the parties maintaining such records themselves. All disputes arising out of the business transacted by the members are referred to the Association for settlement by arbitration.

(4) OWNERSHIP AND CONTROL.

A large number of the grain market places in India are owned privately, *e.g.*, at Nankana Sahib, Karnal, Delhi, Ghaziabad, Benares, Lucknow (Daliganj), etc., and the premises situated in them are let out by their owners on monthly terms, on long or short leases to traders, brokers and, occasionally to owners of small power driven flour mills (*chakkis*). In Delhi, for example, there are six produce markets—all privately owned—situated within the municipal limits in various parts of the city. None are large and, in point of size, cannot be compared with any of the Canal Colony markets of the Punjab. In 1935 several small electrically operated stone mills were operating in some of these markets.

In the Punjab the shop and godown sites in the Canal Colony markets were originally auctioned and the buildings now erected on them belong to the owners. The open square or inner portion of the quadrangle is, however, Government land. The municipalities are generally responsible for the cleanliness of those markets which are situated along public thoroughfares but arrangements for sanitation and conservancy are supposed to be carried out by the tenants or owners of private markets. As a rule these conditions are deplorably unsatisfactory—particularly so in congested areas in large towns. In old settlements, however, at Jhang (Punjab), for example, the market is under the control of the District Board which is responsible for sanitation and lighting of the market premises. A certain sum is charged by the Government on account of proprietary rights. An interesting feature of these markets is that no octroi or terminal tax is levied on the produce brought in. The District Board levies a *hasiyat* (property) tax. A similar system exists in certain parts in Assam. At Goalpara, for instance, no octroi or terminal tax is levied by the Municipal Committee on goods brought into the municipal limits. The municipality charges a house tax on the annual rental

value of the holding and a licence fee from the *zamindar* who owns the local market. The *zamindar* in his turn leases out the market on an annual basis. The lessee is authorised to collect the tolls for letting out the stalls and shops and in practice, collects such dues on a daily basis. The toll rates are Re. 0-0-3 to Re. 0-0-9 per day for stalls in the open and Re. 0-1-0 to Re. 0-1-9 per day for shops.

In the United Provinces some markets, *e.g.*, Basti and Nawgarh are owned by *zamindars* who charge a fee (*zamindari*) from those using the market. This charge may range from 3 to 6 annas per cart of 16 maunds. In certain districts in the United Provinces, however, the entire market place is leased out with authority to the lessee to collect tolls. Again, in other areas the shops and stalls are rented out on monthly or annual basis. In Bihar, the *golas* are owned by the *zamindars* and *goladars* are required to pay the usual rent to the owner. In certain cases, however, the tolls are directly levied by the land owner or by a person who holds a lease from him. In Bengal the sites of the *hats* or markets are almost invariably owned by *zamindars* or land owners. All traders using the *hat* have to pay a toll. In addition a small charge in kind is levied and collected by the owner of the market place, sometimes through a contractor or toll collector for the purpose of keeping it clean.

In Bombay, and in the Central and the United Provinces the market sites in some of the Municipal towns and Notified Areas are owned and administered by the Local Boards. At Saugor, in the Central Provinces, for instance, the Budhwari Bazaar (held every Wednesday) where agricultural commodities such as food grains, groundnuts, vegetables and fruits, spices, *gur*, sugar and sweets, etc., are sold, is organised under municipal control. It is held on *nazul* land for which the municipality pays a nominal sum of Rs. 100 to the Government annually. The municipality has put up stalls and has also provided long strips of open space for displaying goods on the ground. In the case of open sites, rents are levied on the basis of area, *e.g.*, 3 pies per 10 square feet, 6 pies per 11 to 20 square feet and 1 anna for areas over 20 square feet per bazaar day. The stalls are let out on a monthly rental basis, varying between Rs. 2-0-0 and Rs. 4-0-0 per month according to the situation of the stall. The municipality maintains roads running through the bazaar and arranges for the upkeep of public latrines. The municipality issues licences to the local brokers and weighmen. The weights and scales are tested by the municipality before issuing licences. Excepting vegetables, all commodities are subject to an octroi charge.

At Surat (Bombay), the borough municipal bye-laws provide for inspection and superintendence of public as well as private markets and the issuing of annual licences and daily permits to persons desirous of selling commodities in the municipal markets. In certain municipalities in the Central Provinces all arrivals are cessed at 2 annas per cart or 6 pies per pack animal. The income thus derived is spent partly on market sanitation and upkeep as well as on the maintenance of roads, schools, etc. Municipal authorities have power to frame bye-laws, which are subject to confirmation by the Local Government, for inspection and regulation of the markets and for levying fees for the use of buildings and places therein. It does not.

however, seem that the markets established under such authority are as effectively controlled as they are in the case of the regulated markets, since the interests of the growers are not represented on their market committees and they are mostly treated by the municipality as a source of revenue. In the regulated markets which are comparatively few, and are to be found only in the Bombay and Madras Presidencies, the Central Provinces and Berar, and Hyderabad and a few Indian States such as Dewas (Junior), Ramdurg and Faridkot, a certain amount of revenue is derived by the local authorities from market fees, and the licensing of brokers, *arhatiyas* and weighmen and is utilised for laying out and maintenance of the market yard and other premises and in the inspection, control and regulation of market practices including standardisation of weights and measures.

(5) AREA SERVED BY WHOLESALE MARKETS.

This factor depends on the facilities for communication and transport which exist in the locality and also on the preponderance of cash crops. In the Punjab and the United Provinces where communications are better than in most areas, markets in the surplus wheat tracts may on occasions draw their supplies from a radius of about 20 miles. An economic enquiry in the Punjab a few years ago, however, showed that the majority of sellers came from villages within a radius of about 10 miles and this condition may be said to hold good to-day.

On account of the peculiar communications in Central India the area served by the important market of Indore was found to extend to more than 100 miles in certain directions.

In the Central Provinces there exists at least one large wholesale market in every district and in the dense wheat producing districts such as Jubbulpur and Hoshangabad where many of the roads are metalled, there are five or six markets in each. Villages are generally not more than 8 miles from a market town.* Regulated markets such as the Amraoti Cotton Market and the Nagpur Cotton Market, which are under municipal control draw their supplies from villages as far as 40 to 50 miles away.

Areas served by the Port markets are naturally very extensive. Wheat is carried to Calcutta from the Punjab by rail over 1,300 to 1,400 miles whereas the average lead to Karachi from this province is probably not less than 700 miles. The Delhi area† which is almost equidistant from the three ports of Karachi, Bombay and Calcutta, sends wheat, on occasions, over a distance of 900 miles to these sea ports.

(6) REGULATED MARKETS.

In certain markets in Northern India standardisation of market charges and practices has been carried out by the local trade associations and merchants' committees or *panchayats* of which typical examples are Amritsar and Lyallpur in the Punjab and Hapur and Muzaffarnagar in the United Provinces. Although there is no representation of producers' interests on such associations and

*Census of India 1921, Vol. XI.

†Including part of the west of the United Provinces, Eastern and South-eastern Punjab.

panchayats, the fixation of charges and market practices has undoubtedly gone a long way towards minimising malpractices. Some attempt has also been made to establish by law regulated markets where the interests of the cultivators can be protected and to lessen the opportunity for malpractices, such as wrong weighments, undue deductions in weight, price reductions by going back on the original terms of the bargain, as well as to reduce the multiplicity of trade allowances, marketing charges, etc.

Regulated markets, where market charges are clearly specified and trade practices duly controlled by market committees fully representative of all the interests concerned, are found in centres administered under the provisions of the Bombay Cotton Markets Act, 1927, and the Hyderabad Agricultural Markets Act (1929-30). Both of these Acts require that not less than half of the committee members be elected by the growers. There is also a provision for official and local authority representation. The Madras Commercial Crops Markets Act, 1933, is framed on the same lines. Provision is made for growers' representation and for the licensing of brokers and weighmen and for the control of weights, the fixation of price in public and the keeping of returns or accounts in such a way as to render their submission practicable, daily or monthly, as the Market Act may require. At present the Act is enforced in one market only at Tirupur in the Coimbatore district with effect from 1st January 1936, and applies only to cotton. The market committee consists of 10 elected and 2 nominated members. Twenty-nine regulated cotton markets also exist in the Central Provinces and in Berar of which Amraoti, Akola, Yeotmal, Akot and Khamgaon are probably the most important. These markets operate under the rules of the Berar Cotton and Grain Markets Law, 1897, which is similar in the main to the Bombay Cotton Markets Act. Although the Act bears the title "grain" it was found that its rules are only applied to grain in three small markets, *viz.*, Dattapur, Pimpalner and Chandur. At Akola the grain market is situated in the heart of the town at some distance from the cotton market and does not come under the Act. The Central Provinces Agricultural Produce Market Act, 1935, has therefore been devised to apply the principle of regulation to all the grain markets in that province. This measure emerged as law in November 1935 and is also modelled on the lines of legislation already in force in Bombay and elsewhere. It is intended to supersede the management of markets by local bodies such as municipalities, which has not proved as efficient as independent management, by market committees fully representative of all local interests.

The layout of a typical regulated market also shows that much can be done under an organised system of markets. At Amraoti in the Berar, for instance, there is a cotton market established by the cotton market committee. Its area is 600 ft. \times 600 ft., enclosed by a *pakka* wall on all sides with six gates so that the cotton carts may come in by the two gates and go out by the other four so as to avoid congestion. There are two main metalled roads and five branches within the marketing yard. There are two long sheds with corrugated sheet roofing and brick flooring to provide shelter for the cultivators, and another shed for the brokers. A water cistern for

drinking water and two cattle troughs are provided within the market yard. Other buildings accommodate the office of the committee and the residence of its staff. The outstanding feature of the market is that ample space for parking carts and assembling of persons exists for transacting business under clean and sanitary conditions.

The comparative merits and demerits of the various forms of markets will be discussed in greater detail in a special report on the subject. It is sufficient to mention here that, on the whole, the regulation of markets has effected a certain amount of control in the matter of market practices, market charges, brokerage commission and trade allowances as well as sale operations.

Market committees which exercise control over the regulated markets are empowered to issue licences to brokers and weighmen and to cause weights and scales to be inspected through duly authorised members and inspectors especially appointed for the purpose. Any dispute arising out of business transactions effected within the area of operation of the market is subject to settlement through arbitration by the Disputes Sub-Committee. With a view to facilitate transactions and to avoid disputes a system of written contract between buyers and sellers has been introduced. The agreement contains the details of each transaction such as the name of the seller and his address, number of carts sold, name of the buyer, rate per *candy* or *bojha*, date of transaction, signature of the *arhatiya*, signature of the committee's employee and that of the purchaser. Under the terms of the contract, the purchaser agrees that in the event of his refusal to take the seller's cotton at the price agreed upon, when it comes to him to be unloaded, the matter shall be referred to the committee appointed for the purpose whose decision shall be binding on him.

By the end of 1935, the Hyderabad Agricultural Markets Act (1929-30), had been applied to nine towns. This Act has been largely modelled on the Bombay Cotton Markets Act, 1927, and the produce brokers are obliged under the bye-laws of the local market committee to follow exactly the same procedure in regard to wheat and other crops as is observed by the cotton markets in Bombay. When the goods have been weighed by licensed weighmen a receipt is given to the seller with all the above-mentioned details. When the produce is sold the broker again passes the slip in which full details in regard to the rates, marketing charges, weight, etc., are noted. Copies of these slips (locally known as *pattis*) are sent to the office of the Market Committee for reference in case of disputes. The Act has been in force at Raichur for too short a period to enable any definite conclusions to be drawn as regards the effect of these reforms. One effect, however, is already apparent. A large number of sellers used formerly to store their produce in the godowns of their *arhatiyas*. A good proportion of the produce so stored belonged to village merchants or well-to-do cultivators. The produce was not weighed before being deposited in the godowns of the *arhatiya* nor was it customary for a proper receipt to be passed to the owner. The bags were stacked separately and marked with the

name of the owner and if desired an advance of anything from 50 to 70 per cent. of the value was made by the *arhatiya*. The owner of the produce was kept informed of price fluctuations from time to time and it was alleged during the course of this enquiry that the produce was sold only on receipt of specific instructions from the owners. It was found, however, that frequently the *arhatiyas* sold their clients' produce at their own discretion, such sales taking place for delivery *ex store* after the goods had been examined on the spot by buyers. Under the new conditions it appeared that the popularity of the godown system has decreased and a large number of sellers now prefer to sell their produce immediately.

C.—Market functionaries.

Before considering the methods of sale and the market practices obtaining in various types of markets, it may be appropriate to describe briefly the more important functionaries who operate in the markets. The *arhatiya* has already been described, but in addition there are three others of importance. These are (1) the *dalal* or broker, (2) the *tola* or weighman, and (3) the *palledars* or market labourers.

(1) THE *dalal* OR BROKER.

This is usually a person of modest means, generally a member of one of the trading communities. He is met with in practically every market, but more specially at the ports and in the larger centres of trade. Occasionally a large firm may combine brokering with its other activities, but this is a comparatively rare occurrence except possibly at the ports. In almost all upcountry assembling markets, the broker maintains no establishment. He has no stock-in-trade and has an insignificant amount of clerical labour to undertake. His chief function is to bring buyers and sellers together and he achieves his purpose by personal calls and by constant use of the telephone where available. In those assembling markets in which a broker, by custom, forms an essential link between the buyer and seller he generally represents the buyer while in the distributing markets, in consuming centres, he may represent either the buyer or the seller according to the circumstances. In some of the primary markets the broker assumes the rôle of a *kachcha arhatiya* and thus negotiates on behalf of the seller, as, for instance, at Banda in the United Provinces. In this rôle he also functions as a weighman and may therefore be known as *dandidar*. The broker's remuneration or fee is known throughout India as *dalali*. Its amount is discussed in a subsequent section dealing with market charges.

(2) THE *tola* OR WEIGHMAN.

In certain markets weighmen form a distinct class or community of their own and pursue no occupation other than weighing. In other markets they are employed by *arhatiyas* who may also use their services as messengers, etc. The *kachcha arhatiyas* themselves may, as already stated, attend to the weighing of produce. In certain

markets of Berar,* in Central India† and Hyderabad‡ the weighmen are licensed and have to conform to a fixed scale of charges. The charge for weighment is known everywhere as *tulai*.

(3) *Palledar* or *hammal*.

These are names given to market labourers. Some operate on their own while others are in the employ of *arhatiyas*. They perform various functions relating to the handling of the produce such as unloading the cart, cleaning and dressing the produce, assisting in weighing, bagging, stitching the mouths of bags, stacking, etc. In most of the markets their wages are known as *palledari* or *hammali* and are fixed by trade custom and long usage.

(4) OTHERS.

Certain other functionaries such as waterman, sweeper, watchman, cook, etc., are part and parcel of the market system in India. They serve the merchants and their clients in a number of ways although they are not strictly speaking directly concerned with the transaction of business. In markets having grain trade associations or market *panchayats*, which have fixed market charges these petty functionaries are paid by the *arhatiyas*. In the large majority of the other markets in which organised trading does not exist, deductions are made from the sellers, often in quite considerable amounts for the purpose of their remuneration. Mention might also be made of the *munim*, the *arhatiya's* clerk or accountant. This functionary is usually employed on a fixed salary but in a number of markets in the eastern parts of the United Provinces and in Bihar a charge known as *munimi* is recovered from the seller, and occasionally from the buyer.

D.—Market practices.

(1) GENERAL.

In the majority of the upcountry markets the market practices have the sanction of long usage and tradition. During this survey it was found that local customs did not differ greatly in principle from one province or State to another, but there were considerable variations in detail. Market legislation, mainly in respect of cotton, in parts of the Bombay Presidency, in Hyderabad (Deccan) and in Berar (Central Provinces) has in many respects improved conditions by specifying the various market charges and licensing market functionaries, etc. Some measure of success has also attended the efforts of a number of grain trade associations or "futures" exchanges in Northern India to standardise local market charges while in the Central Provinces progress has been made in the same direction in some of the markets controlled by local authorities. The number of instances in which any material improvement has been made are, however, comparatively few and in the great majority of markets the same old general and ill-defined customs prevail.

Before the seller actually reaches the market he is more often than not accosted on the road or at the terminal tax or octroi posts

*Akola, Amraoti.

†Dewas, Bhopal.

‡Aurangabad, Jalna, Nanded.

on the border of the municipal area by touts employed by the *kachcha arhatiyas*. These may be specially employed for the purpose or are more frequently employees of the *arhatiya*, as for example, his *munim*. Those cultivators who are recognised as being regular patrons of the market are generally spared the attentions of the *arhatiya's* agents but the competition to secure a new client is very keen. Every inducement is held out to a new comer to patronise this or that *arhatiya* and in Delhi it is quite common for the *arhatiyas'* agents to pay the terminal tax, to be adjusted later, on behalf of the cultivator and relieve him of as much trouble as possible with the terminal tax officials in order to secure or retain his custom. The same procedure is followed throughout the length and breadth of the country. In Burma, for example, the merchants at Taungyi in the Southern Shan States send their touts every morning 2 or 3 miles along the roads to meet the carts bringing rice for sale and for this service they are paid 2 annas per 100 baskets of business secured.

Tolls, in the shape of terminal tax or octroi duty, are levied on most commodities or produce arriving within the limits of municipalities and notified areas. These are a source of much irritation. They are expensive to collect and their incidence is inequitable as they are levied mainly on bulk or some arbitrary classification and not on value. Moreover it is unusual for the cultivator or trader bringing his produce to the market to escape payment of the gratification significantly known almost everywhere as "*mamul*" or "*mamuli*", i.e., something quite ordinary, to the municipal post staff. The range of these tolls, in different localities, is given later.

Having entered the precincts of the town the cultivator or trader, if he is a "regular", proceeds to his usual *arhatiya*. If a new comer, he is accompanied by the *arhatiya's* tout or agent who has solicited his patronage and who takes him along to his employer's shop.

(2) HOURS OF BUSINESS.

Sellers generally reach the market an hour or two before trading starts. If the goods are in bulk, as is usual, the interval may be employed in preparing it for sale, i.e., sieving it where mixed, parking the carts, watering the draught animals or cooking the morning meal—especially where the carts have come from a long distance. Cultivator-sellers, whose villages are within a few miles from the assembling centre, usually prepare their food at home and bring it with them.

The hours of business in the different markets vary. In the Punjab, trade starts at 7 A.M. in the Ferozepur district. In Lyallpur the market opens at 10 A.M. while at Chakjhumra, a few miles away, trade begins in the early afternoon. In most of the markets of the United Provinces it is customary for dealings to commence in the early morning and finish by about noon. The afternoons are devoted to taking delivery and settling the accounts of the morning's transactions. In the Central Provinces and Bombay the day's actual trading finishes in the forenoon, deliveries and accounts occupying the rest of the daylight hours. This division of the average

day's programme seems to be fairly universal and is probably the best under the circumstances as it enables the cultivator to reach the market in the early morning and be back in his village the same night*.

Several factors, however, tend to delay or prolong the marketing process. It has been observed particularly in Northern India that in the cold weather buyers do not usually appear until the sun is well up, say, about 10 o'clock, so that the paucity of buyers and a slow market may often detain the seller for more than a day, unless he hands the wheat over to the *arhatiya* for subsequent disposal and obtains an advance—usually 70 per cent. of its value—and returns to the village. During the hot weather on the other hand, which synchronises with the harvest rush of arrivals, there is great activity in the early morning and dealers are always anxious to conclude their business before the heat of the day. Business is therefore often over before noon.

(3) METHODS OF SALE.

Before the wheat is offered for sale it is generally emptied out of the cart and heaped on the pavement or plinth in front of the *arhatiya's* shop. In this the seller is usually helped by one or other of the *arhatiya's* labourers, who also assist him to dress over the heap roughly by removing the chaff and larger impurities on the surface (*see* plate facing page 153). In many markets, as for example, Gojra, Toba Tek Singh, in the Punjab Canal Colonies, where arrivals during the height of the season are too large to be accommodated on the pavement in front of the *arhatiyas'* shops, some of the produce may lie in the carts. With the exception, however, of the short post-harvest rush of arrivals the custom in most markets is to exhibit the wheat in heaps on the ground. In some markets, *e.g.*, Ghaziabad and Cawnpore in the western and central districts of the United Provinces, only produce brought by pack animals is heaped, and wheat brought in carts is sold by the cartload without the goods being unloaded. This also appears to be the system in Sind and in parts of Bihar. After sale the cart is sent to the buyer's godown where delivery is eventually given. In Central India the carts are not usually unloaded until the contents are sold, but in the Central Provinces the wheat is generally emptied from the cart and heaped before the *arhatiya's* stall or shop. Ordinarily each heap is auctioned separately and knocked down to the highest bidder.

Of the two systems of taking delivery (*a*) at the *kachcha arhatiya's* shop and (*b*) at the buyer's godown, the latter in theory is more economical as the buyer is thereby saved certain expenses the benefit of which could be passed on to the cultivator-seller in an enhanced price. Under present conditions, however, where cases of false weighments, disputes about *karda* (refraction) allowances and other malpractices are by no means uncommon, it is not so and the interests of the cultivator-seller are on the whole better protected if delivery is made in the presence of the *arhatiya* or his representative.

*Under the Bombay Markets Act power has been given to the Market Committees to regulate hours of business.

Rates are fixed and transactions concluded by one of the three methods, *viz.*, (a) under cover (b) by auction, and (c) by private treaty.

(a) In the first method* the buyer or his broker clasps the hand of the *arhatiya* under cover of a cloth, usually a small towel or a *dhoti* and by pressing the fingers indicates the rate he is prepared to pay. This primitive system prevails practically throughout the entire country and at many of the largest markets in Northern India such as Lyallpur and Amritsar in the Punjab and Hathras in the United Provinces. It is also the normal method of sale in Indore (Central India) and at Itarsi and Harda in the Hoshangabad district of the Central Provinces. The method of settling rates under the *purdah* system may be either by single bid or repeated bids. The single bid system prevails at Lyallpur, Gojra and a few other markets and was obviously designed to save time as very large quantities of wheat arrive daily during the season. Repeated bids are, however, customary at the majority of the markets in the Punjab. One offer only is allowed in a number of Central Provinces markets where the cover system prevails. At Kareli the *arhatiya* announces the name of the highest bidder who then declares his offer. At Itarsi the *arhatiya* himself announces the name of the buyer and the rate.

(b) In the auction system, a comparatively recent development, the prospective buyers declare their bids aloud to the auctioneer who may either be the *arhatiya* or broker and the goods are eventually sold to the highest bidder. The auction system prevails in the south of India generally, in the large western markets of the United Provinces, *e.g.*, Hapur, Muzaffarnagar, etc., and in some of the east and central districts of the Punjab such as Ferozepore, Moga, etc. (*see* plate facing page 153). Although the auction system is more common in the Central Provinces the cover system is largely in vogue in the Hoshangabad and Jubbulpore districts. A modified form of the auction system exists at Pipariya where the *arhatiya* takes a sample of the goods round to the various buyers and solicits their bids. In some markets, *e.g.*, Drug and Rajnandgaon, in the east of the Central Provinces, there are two auctions, the first carried out by a market official—representative of the municipality—who auctions each heap to the *dalals* or brokers. When all the heaps are sold in this manner a second auction takes place; this time each broker auctions his own purchases to other buyers. The auction system is also common in many markets in Rajputana and Central India, *e.g.*, Kotah, Datia and Dewas in the States of those names.

(c) Wheat is sold by private treaty or by a system known as the "open" bid system. This implies, as at Delhi for instance, that individual buyers may come at whatever time is convenient to them and depart having made their bids either alone or in the presence of other buyers, if there are any. These bids are not necessarily binding on the person making them unless a specific understanding has been arrived at beforehand and the *arhatiya* may accept or refuse

*The Bombay Cotton Markets Act prohibits the settlement of transactions by secret signs.

any offer received during the course of the day. Sales by private treaty are also common in the northern parts of the Punjab, at Muzaffarnagar, Agra, Cawnpore, Fyzabad, Benares, Lucknow and most of the other consuming centres in the United Provinces. It is also a common method of sale in the smaller markets of Central India and Rajputana as well as in Bihar and Sind. In Hyderabad (Deccan) both auction and private settlements are common.

(d) *Comparison between different methods of sale.*—The cover system of bidding under the cloth appears on the whole to be more generally employed in the larger grain markets of India than any other. In the Punjab, for instance, it was found in 29 out of 46 markets. Of the other 17 the auction system prevailed in 12 and private settlement in 5. Some contend that the cover system is more advantageous for the seller because buyers who have a fixed limit from their principals are more likely to offer the full price as they do not know what other buyers are bidding. In the auction system the buyer raises his bid gradually and he may eventually secure the wheat at a price lower than his maximum limit. This would not happen if he were ignorant of what his competitors are offering. Others again regard the cover method as being inimical to the interests of the seller, primarily because he often does not know what the rate is and secondly, that the competition stimulated by the auction system is absent. Another point in favour of the auction system is that the seller is able to follow the bidding. With the cover system the scope for malpractices appears to be considerable, usually to the disadvantage of the cultivator-seller. For instance, the *arhatiya* may not disclose the true rate to the latter. Further, in the Punjab Canal Colony markets where the cover system is prevalent the custom of auctioning a number of heaps together (known commonly as *dara* sales), each possibly belonging to a different party, definitely lends itself to dishonest practices, and apart from this the better qualities do not receive their full premiums.

There is apparently a tendency on the part of many traders in markets using the cover system, particularly in the Central Provinces, to change over to the open auction. Each system has probably its merits and the method of concluding transactions under cover would appear to be reasonably satisfactory if the final rates were openly announced at once as is the practice in some markets in the Central Provinces.

During the bargaining the owner of the goods, if he is present, has very little to say. He takes his cue from the *kachcha arhatiya* who conducts all the negotiations on his behalf. Should, however, the price offered be unacceptable to the owner of the wheat he is at liberty to withdraw and abstain from selling.

Wheat and other produce may be sold not only in individual lots, but also in heaps of varying qualities lumped together and disposed of at a flat rate. This practice of "*dara* sales" is prevalent in the Punjab Canal Colony markets and in the Hapur-Muzaffarnagar area in the United Provinces. It is advantageous from the buyer's and *arhatiya*'s view point as it is rapid and saves a good deal of clerical labour on both sides. At the same time the system definitely

discourages the production of good quality. There seems no doubt that when such mixed lots are sold the rates apportioned by the *arhatiya* to the sellers, make inadequate distinction between the best and the most inferior. Further the *arhatiya* commonly uses his discrimination in favour of special clients and worse still sometimes seizes the opportunity to derive excessive gains.

(4) BASIS OF SALE.

The basis of sale in the case of wheat sold in the market may be subject to :—

- (a) the removal of dirt and large impurities, i.e., cleaned wheat ;
- (b) fixed deductions (*karda*) for dirt according to usage which may be made either before or after price fixation ;
- (c) variable deductions settled after the goods have been visually examined for refraction and general appearance ; and
- (d) *dhalta* or *dane* (weighing allowance).

The cleaned wheat basis prevails at the Canal Colony markets in the Punjab and some of the larger centres in the western districts of the United Provinces such as Hapur, Muzaffarnagar, Ghaziabad, etc. The goods are dressed in a rough and ready manner by the process of "*rulai*"* by which the surface of the heap is turned over by the circular motion of the hands, palms downwards, passing over it so that the heavier impurities tend to sink to the bottom of the pile or roll down the sides. This part of the heap is subsequently sieved and winnowed to recover the wheat. The chaff is brushed off the pile with a broom.

Deductions based on a supposedly fixed scale of refraction are known as *karda*†. It is possible that *karda* was originally reckoned on the basis of the average quality of wheat sold in the locality and has now acquired the sanction of long usage. In most cases it has lost any direct relationship it may have had to the actual impurity content or general characteristics of the local wheat. These deductions are prevalent in a large number of markets in the United Provinces such as Fyzabad, Lucknow, as well as being the normal custom in the Central Provinces but not in Bihar.

The appraisal of the individual quality characteristics of the wheat after rough and ready visual examination is common in Central and Southern India and in many of the smaller markets of the United Provinces. The system is unobjectionable when the deduction has been mutually settled between buyer and seller and the price fixed accordingly, but the practice is reprehensible when, as may often happen, particularly in south India, the price is fixed and further deductions are claimed by the buyer when the goods are about to be delivered.

**Rulai*—literally "rolling".

†*Karda*—variant of *garda* literally "dirt"

Sales based on the deduction known as *dhalta* prevail very largely in the United Provinces, in Bihar and in a few markets in the Eastern Punjab such as Ambala. *Dane* is a deduction in kind and is apparently associated with *karda* almost as much as with *dhalta*. *Dhalta* is an allowance for weight and probably originated as a draffage allowance for turning the scale to compensate the buyer for the loss in weighing out in small lots (seers) wheat purchased by larger weight units (mds.). Where, as frequently happens, the goods are weighed on to the buyers in small units to be subsequently sold on large units (*see below*) the deduction becomes an unwarrantable imposition on the seller. It varies in amount according to local custom and ranges between $\frac{1}{2}$ seer per maund ($\frac{1}{8}$ per cent) to $\frac{1}{2}$ seer per maund ($1\frac{1}{4}$ per cent). The former rate of deduction is probably the most common, and the latter was found to obtain in Bihar.

(5) DELIVERY.

Assuming that the bargain has been struck and the price agreed on one of the foregoing bases the next process is weighment. If, as is usual in most of the northern *mandis*, the arrivals are in bulk, the goods are weighed over by one of the *arhatiya*'s employees, a professional weighman (*tola*) or by a licensed weighman as in most of the Central Provinces markets and wherever regulated markets exist, or sometimes by the *arhatiya* himself if the latter is in a small way of business working single-handed. Such weighments are normally made by the hand balance capable of dealing with 5 seers (about 10 lbs.) at a time. (*See plate on opposite page*).

The wheat is filled into gunny bags direct from the scale pan. The bag is held by a special functionary while a second person attends to the filling of the scale pan (*see plate on opposite page*). These are usually paid in kind* after the weighment has been completed. As a rule when the bags have been filled, about 10 per cent. are subsequently checked over on a large beam scale capable of handling heavy weights up to several maunds at a time. In parts of the Punjab platform scales are sometimes used for this purpose. In order to compensate for the tare of the bag an empty bag is usually placed alongside the weights or alternatively a fixed deduction of 1 seer (2.057 lbs.) may be made corresponding to the weight of the popular B-twill jute sack ($2\frac{1}{4}$ lbs.). In certain markets the fixed tare recognised by local usage may be $1\frac{1}{2}$ to $1\frac{1}{4}$ seers. In the Punjab sixteen markets out of 22 examined in this connection allowed a tare of 1 seer per bag and the remainder $1\frac{1}{4}$ seers.

When delivery and check weighment have been completed the bags are stitched with jute twine, usually by one of the *palledars* or labourers and are then taken to the buyer's godown, almost always at the latter's expense and by his own labour. In a few markets

*Market payments in kind are made to the weighman and his assistant, to the *tola* who roughly dresses the wheat, the *charhava* who fills the scale pan, and the *ota* who holds open the mouth of the bag and the *munim* or clerical assistant of the *arhatiya*. In addition small deductions in kind are made on behalf of the sweeper, the *chaukidar* or watchman, the waterman, the *arhatiya*'s cook and the beggars who frequent every market.



A TYPICAL KACHCHH ARHATIA WEIGHING OVER WHEAT TO
A RETAIL PURCHASER.



WEIGHING OVER A HEAP OF WHEAT.
Note the four functionaries employed in this operation.



DRESSING AND CLEANING WHEAT BY PASSING IT THROUGH BAMBOO OR CANE SLATS.

This method is very commonly used for separating wheat-gram mixtures



AUCTIONING A HEAP OF WHEAT IN A MARKET IN THE EAST PUNJAB.

The prospective buyers may be seen examining samples preparatory to making their bids.

only it is customary for delivery to be given in the buyer's godown. In such cases all delivery charges to the buyer's door are borne by the seller.

(6) MALPRACTICES.

It has been observed that when market arrivals are heavy the weighing of the morning's transactions is sometimes not completed the same day and produce may be left over for weighment the following day. Should the market have fallen meanwhile, it is not uncommon for buyers to claim on the following day a further allowance from the seller on one pretext or another.

This raises the question of the binding power of bids and acceptances. A recent enquiry into market practices in the Punjab under the auspices of the Board of Economic Inquiry showed that four different systems obtained in a number of the largest markets. At Rohtak, *kachcha* transactions (i.e., non-binding or subject to alteration) were the rule. Either party could break off at any time and without stating any reason. *Pakka* or firm transactions, from the seller's point of view only, obtained in one market (Fazilka), but the buyer was entitled to break off without assigning any reason. A third system was definitely binding on the seller but the buyer could claim an allowance should the quality of the heap be inferior at the bottom than at the surface. In the event of the seller disagreeing with the deduction the buyer was at liberty to withdraw. The fourth and last system was *pakka* or binding on both sellers and buyers provided the quantity involved was not more than 50 maunds. If the quantity was greater the buyer was entitled to claim an allowance should the quality in his opinion be inferior. Should the seller not agree the transaction was liable to be cancelled.

Similar conditions exist also in many other markets of Northern India. In the interests of all and of the cultivator-seller in particular it is desirable that a clear definition should be established as to what constitutes a firm bid and an acceptance. During the course of this survey complaints were made in various markets regarding the system of sale and particularly as to the non-observance of settlement agreed upon at the time of closing the transaction. At Kasgunj in the United Provinces it appeared that as weighments are in progress the buyer begins to complain of excessive refraction. Such complaints increase as delivery proceeds. Eventually when about $\frac{1}{3}$ or $\frac{1}{2}$ of the cart has been taken delivery of, the buyer stops delivery until such time as an extra discount is made off the price already settled. The only alternative left for the cultivator-seller is to refill his cart and take it away, but this course is seldom followed since it is impracticable and inconvenient for him to return and await another day's trading. Another bad practice at Kasgunj and in other markets is that the cart is unloaded and weighed at the *kachcha arhatiya's* shop and the wheat is then carried to the buyer's premises by the latter's own labourers. The buyer re-weighs the grain again in his own godown in the absence of the seller and subsequently holds him responsible for the difference in weight.

E.—Market charges.

Wheat passes through several hands on its way to the eventual consumer and therefore various expenses are incurred at different stages, *e.g.*, cleaning, handling, brokerage, etc. The present section deals entirely with the charges incurred on wheat on the first stage of its journey from the time it passes into the municipal limits until it reaches the buyer's godown in the assembling and wholesale markets.

The detailed charges reduced for the sake of comparison to a uniform basis, *viz.*, per hundred rupees worth of produce are shown in appendices XXIII to XXIX for a representative number of markets in each major producing province and State. At a glance it will be obvious that no relation exists between the charges of one area and those of another. Further these charges may differ widely and may be variously payable by the seller in some instances and by the buyer in others. In some markets the *kachcha arhatiya* or commission agent also incurs certain items of expense, *e.g.*, terminal tax, weighing, etc., all of which have ultimately to be recovered either from the seller or buyer according to local custom. There also appears to be no uniformity or generally recognised rule as to which charges should be borne by seller and which by the buyer. In consequence therefore a deduction which falls on the seller in one market may be charged to the buyer in another with the result that the proportion of the charges payable by buyer and seller may differ widely. Market charges in a good many instances may be paid either in cash or kind indiscriminately and even brokerage (*dalali*), normally a cash item, may be recoverable in kind as at Ghaziabad in the United Provinces.

In a number of markets such as Lucknow, Banda and others more than half of the entire market charges are levied in kind while in certain other markets such as Agra there are no charges payable in kind at all. With the exception of a few markets in which trade customs, as already mentioned, have become largely standardised as a result of the operation of market legislation or the influence of some local trading organisation, there appears to be no regulation whatever over the incidence of merchandising expenses. It is probably due to this chaotic state of affairs that the cultivator is at times driven to selling his produce on the farm instead of disposing of it in a market where though the rates may be generally high the charges or deductions are so numerous and confusing that whatever slight benefit may accrue from the enhanced price which may be quoted, is lost in the shape of numerous impositions.

Before discussing market charges as a whole it seems desirable to describe the various items of expenses stating briefly where they occur, where most and where least, and which of the parties to the transactions have to bear their incidence.

(1) *Arhat* (COMMISSION).

This is the *arhatiyas'* remuneration. It may be paid by the seller or by the buyer jointly or individually. Whenever commis-

sion is levied on the buyer it may be termed *dami*. *Arhat* or *dami* is almost invariably payable in cash and in some markets, as for instance at Abohar (Punjab) and Muzaffarnagar (United Provinces), *arhat* always includes weightment charges. The wages of the labourers (*palledari*) and brokerage may also be included in the commission charge as at Budhlada and Karnal in the Punjab.

In the Punjab in 18 markets out of 46 studied, *arhat* is paid jointly by seller and buyer. It was found that the seller's share varied from Re. 0-9-9 per cent. at Sillanwali to Rs. 1-7-6 at Khanewal. The buyer's share ranged between Re. 0-2-6 per cent at Lyallpur and Re. 0-10-0 at Sargodha. In 12 other markets *arhat* was paid by the seller alone and ranged from Re. 0-8-0 per cent at Hassan Abdal to Rs. 1-9-0 at Gujranwala. In the remaining 16 markets *arhat* was payable by the buyers alone, and varied from Rs. 1-3-0 to Rs. 1-14-0 per cent at Rohtak and Fazilka respectively. In the Colony markets it is customary to share this charge between buyer and seller in varying proportions.

In 5 out of 10 important assembling markets investigated in the western districts of the United Provinces *arhat* was payable jointly by the buyer and seller and in the other five markets by the buyer only. In the first group the buyer's share varied from Re. 0-6-3 at Muzaffarnagar to Rs. 1-1-0 at Deoband, and the seller paid from Re. 0-6-0 per cent. at Shamli to Re. 0-12-6 at Deoband. In the second group in which the buyer alone is responsible for payment of this charge the rate of commission ranged between Rs. 1-5-0 at Hathras to Rs. 1-9-0 at Meerut. It may be observed that until a few years ago the usual custom was to charge *arhat* to the seller and the present tendency seems to levy the charge on the buyer. The changeover has been noticed both at Ghaziabad and Sikandrabad.

In the Central and Eastern markets of the United Provinces in two of the six centres for which details are available, *arhat* is payable by the seller alone and was Re. 1 and Rs. 1-12-0 per cent at Bareilly and Banda respectively. At Cawnpore on the other hand *arhat* is payable by the buyer only at the rate of Rs. 1-4-0 per cent. In the remaining 3 markets the charge is shared between seller and buyer, the former's share varying from Re. 0-7-6 per cent at Lucknow to Re. 1 at Fyzabad and the latter's from Rs. 1-9-0 to Re. 0-12-6 per cent at these two respective stations.

In the Central Provinces *arhat* was found to be payable always by the seller and in 10 important markets this charge ranged from Re. 0-3-4 per cent at Katni to Rs. 1-7-4 at Damoh. Out of 11 markets reviewed in Bihar and Orissa, *arhat* was paid jointly by seller and buyer in 10, the share of each ranged from Re. 0-12-0 per cent at Darbhanga to Rs. 1-9-0 at Muzaffarpur. The total commission charged in this province (Rs. 1-8-0 to Rs. 3-2-0 per cent) is relatively higher than in the Punjab or the United Provinces, where the extreme variations range from Re. 0-14-0 per cent at Karnal to Rs. 1-14-0 at Fazilka, and Re. 0-12-3 per cent at Shamli to Rs. 2-0-6 at Lucknow.

In the markets of the Bombay presidency *arhat* is generally payable jointly by seller and buyer. The rates in five important

markets ranged from Rs. 2-1-0 per cent at Bijapur to Rs. 2-9-0 at Dharwar. At Hubli and Belgaum in the Carnatic, commission is paid by the seller and is Rs. 1-9-0 per cent.

Information relating to the rates of *arhat* charged in regulated markets is available only from Hyderabad (Deccan) and is reported to vary from Rs. 1-3-6 per cent at Jalna to Rs. 2-3-9 at Latur. At the unregulated markets of Bid and Secunderabad the *arhat* rates were Re. 0-15-11 per cent and Rs. 2-7-1 respectively. The Hyderabad Agricultural Markets Act empowers the market committees created by the Act to fix market charges and the relevant section of the Act reads as follows :—

“ No allowance or deduction shall be demanded or taken except those mentioned in the list sanctioned by the Market Committee and exhibited in a conspicuous place.”

(2) *Dalali* (BROKERAGE).

As already mentioned the *dalal* is a feature of the larger markets only. In the Punjab brokerage was not charged in 13 out of the 46 markets examined. In 21 markets it was paid by sellers only, the maximum being Re. 0-5-0 per cent at Sialkot and the minimum Re. 0-1-0 at Toba Tek Singh in the Canal Colony area. At two markets, e.g., at Budhlada it was found to be levied jointly on seller and buyer, the former's share being Re. 0-1-3 per cent and the latter's Re. 0-4-0. At 8 markets brokerage was paid by the *arhatiya* and in the remaining 2 markets of Karnal and Dera Ghazi Khan the charge was paid by the buyer only at Re. 0-2-0 per cent and Re. 0-10-3 per cent respectively.

In the United Provinces only half of the total number of markets investigated recognised the charge. Where levied it was generally found to be payable by the seller and ranged from Re. 0-1-0 per cent at Shamli to Re. 0-10-0 at Cawnpore. The average rate would seem to be in the neighbourhood of Re. 0-4-0 per cent. The average rate is also the same in the Central Provinces where brokerage is usually paid by the seller ; on the other hand in the adjacent markets of the Bombay presidency brokerage is payable by the buyer. At Bijapur the rate was Re. 0-8-0 per cent and at Belgaum it was as high as Rs. 1-9-0. *Dalali* is apparently not a regular market charge in Hyderabad (Deccan) nor in Bihar.

(3) *Karda*.

In many markets this is a fixed item, e.g., at Hathras in the United Provinces ; in others it is elastic and settled before or after sale, generally the former, and has a bearing on the price offered which is based on the buyer's estimation of the quality.

In most of the markets in the Punjab wheat is deliverable only after the rough and ready dressing, known as *rulai*, has been made. In such instances no deductions for *karda* are made. In a few markets only, e.g., Lahore, *karda* is deducted at a fixed rate of 1 seer per bag of 2½ maunds, i.e., 1 per cent.

Karda is a common deduction in most of the Central and Eastern United Provinces markets and is usually between ½ to 1 seer per maund. In the west of the province where trading conditions

have been standardised to some extent under the influence of the local trading associations this deduction is not in vogue with rare exceptions, *e.g.*, Hathras.

A fixed scale of deductions on account of *karda* obtains at some of the markets in the Central Provinces as for instance, Katni and Pipariya. These range from 1 to 1½ per cent.

In the Punjab the excess weight deliverable by the seller varies from ¼ seer per bag of 2½ maunds at Fazilka to 1¼ seers at Mandi Bahauddin. It would appear that the most common rate is about 10 *chhatanks* per bag. The following table summarises these allowances :—

Market.	Declared weight.	Dane allowance.	Tare.	Actual weight claimed by buyers.
	Md. Sr. Ch.	Md. Sr. Ch.	Md. Sr. Ch.	Md. Sr. Ch.
Arifwala	{ 2 20 0 2 25 0	0 0 10 0 0 11	0 1 2 0 1 2	2 21 12 2 26 13
Burewala	Do.	Do.	Do.	Do.
Montgomery	2 20 0	0 0 10	0 1 2	2 21 12
Okara	2 20 0	0 0 10	0 1 1	2 21 11
Sargodha	2 20 0	0 0 11½	0 1 2	2 21 13½
Phullerwan	2 20 0	0 0 11½	0 1 0	2 21 11½
Mandi Bahauddin	2 20 0	0 1 4	0 1 0	2 22 4
Gujrat	2 20 0	0 1 4	0 1 0	2 22 4
Ferozepur	2 20 0	0 0 10	0 1 0	2 21 10
Moga	2 20 0	0 0 5	0 1 0	2 21 5
Fazilka	{ 2 20 0 2 10 0	0 0 4 0 0 4	0 1 0 0 1 0	2 21 4 2 11 4
Muktsar	2 20 0	0 0 12	0 1 0	2 21 12
Gujranwala	2 20 0	0 0 8	0 1 4	2 21 12
Ambala	2 20 0	0 0 10	0 1 0	2 21 10
Sirsa	2 20 0	..	0 1 0	2 21 0
Budhlada	2 20 0	..	0 1 0	2 21 0
Karnal	2 20 0	0 0 10	0 1 0	2 21 10
Bahadurgarh	2 20 0	0 0 5	0 1 0	2 21 5
Sonepat	2 20 0	..	0 1 0	2 21 0
Gurgaon	2 20 0	..	0 1 0	2 21 0

In most of the markets of the United Provinces it is customary for the buyer to be credited with *dane* at the rate of from $\frac{1}{2}$ to $\frac{1}{4}$ seer per maund. In the markets of Southern India where *karda* is the common deduction these two charges (*dane* and *dhalta*) do not seem to exist.

(4) HANDLING (*palledari* OR *hammali*).

The costs of handling normally comprise wages paid to labourers, weighing charges and cartage to the buyer's godown. For the purpose of convenience these are treated under two heads, *viz.*, (a) handling as far as and including the weighment stage, and (b) from weighment up to the buyer's godown, including cartage as shown in appendices XXIII to XXIX.

Under the first head the usual items are unloading the cart, dressing the produce, sieving and cleaning, filling the scale pan and weighing. Remuneration for these services is generally paid by the seller, mostly in kind. In the Western United Provinces the total charges for these operations varied from Re. 0-2-6 per cent at Hathras to Re. 0-14-6 at Shamli and Bareilly, the average cost working out to Re. 0-7-6 per cent of which Re. 0-6-0 or 80 per cent was payable by the seller. The buyer was found to be liable for these charges in 6 markets only out of 16. In the markets of the Central Provinces, the costs under this head are also borne by the seller and vary from Re. 0-6-3 per cent at Itarsi to Rs. 1-8-2 at Pipariya, the average for 11 markets being Re. 0-14-1, the seller contributing 94 per cent of the total.

Exactly comparable data relating to Punjab markets are not available. In that province these items are usually paid by the seller and the all-in charges for handling up to the point the produce is ready for transportation to buyer's godown vary from Re. 0-2-0 per cent at Karnal to Rs. 1-2-9 at Burewala. In the majority of instances this charge is payable partly in cash and partly in kind.

In Bihar and Orissa the same system is followed as in the Punjab and the total charges vary from Re. 0-1-3 per cent at Jamalpur to Rs. 1-8-0 at Purnea, in the latter instance it is payable by the buyer.

In the markets of Hyderabad State this charge is paid generally by the seller and ranges from Re. 0-5-6 per cent at Nanded to Re. 0-8-3 at Secunderabad.

Under the second head the items included are *otna* (holding the bag), *silai* (stitching), checking the weight and loading, unloading or stacking the bags as the case may be in the buyer's godown including cartage from the market. The rate of cartage and the services of the cartman and his assistant varies according to the distance to be traversed and is always payable by the buyer. It generally ranges between 3 ⁴/₁₆ pies and 9 pies per bag. In the Punjab, for example, the average rate of cartage works out to Re. 0-9-0 per cent.

Out of the 16 markets reviewed in the United Provinces this charge is paid jointly by the seller and the buyer in 6. On

an average the seller pays one-third and the buyer two-thirds. The total expenses vary from Re. 0-4-0 per cent at Fyzabad to Rs. 1-4-0 at Bareilly, the average for the 6 markets being Re. 0-11-7. In four markets (1 western and 3 elsewhere) it is paid by the seller alone and ranges from Re. 0-5-0 per cent at Banda to Re. 0-13-6 at Hathras, the average rate being Re. 0-11-0. In the other 4 markets in the western districts it is paid by the buyer, the rate varying from Re. 0-8-0 at Deoband to Re. 0-10-6 at Chandausi. To some extent these variations are due to the distances at which the buyer's godowns are situated from the market.

In 5 markets out of 11 in the Central Provinces these charges are wholly payable by the buyer and in 2 by the seller only. The charges vary from Re. 0-3-4 per cent at Damoh and Saugor to Rs. 1-7-3 at Umrer.

In Bombay this charge in all the 5 markets for which details are available, is payable jointly by seller and buyer, the former's share varying from Re. 0-6-3 to Re. 0-10-6 per cent and the latter's Re. 0-6-3 to Rs. 1-2-9. The average rate works out to Rs. 1-2-4 per cent and is payable by buyer and seller in the proportion of 55 and 45 respectively. At Shikarpur and Sukkur in Sind the buyer is responsible for this charge at the rate of Re. 0-0-3 per maund which is equal roughly to Re. 0-10-6 per cent.

No useful purpose can be served by discussing the various details regarding the rates and methods of payment for the individual operations which form part of the whole process of handling in the market as they vary endlessly and are based on no special principles. A reference may however be made to the charges for *tulai* which is by far the most important item included under the above heads.

(5) *Tulai*.

This weighing charge is generally payable by the seller both in cash and kind. In a number of markets in the west of the United Provinces, *tulai* is paid by the *arhatiya* from his own remuneration (*arhat*). The rate of *tulai* varies considerably. In the Punjab this charge is directly levied on the seller in 25 out of 46 markets examined at the rate of anything between Re. 0-2-6 per cent as at Jullundur and Rs. 1-4-0 per cent at Hassan Abdal. In 20 markets the *arhatiya* is responsible for the payment of this charge and as the weighment itself is usually effected by one of his own employees no actual deduction is made from the seller's account under this head. In the eastern United Provinces and other parts *tulai* is generally payable by the seller, and wherever the charge is payable in kind, the rate varies between 1 and 2 *chhatanks* per maund (Re. 0-2-6 per cent and Re. 0-5-0 per cent). In the United Provinces *tulai*, when paid in cash, varies from Re. 0-2-0 to Re. 0-10-0 per cent.

(6) CHARITY (*dharmada*, *dharmao*, etc.).

In almost all the markets of India charity forms a regular item in the list of customary merchandising charges. The purposes for which this deduction may be made are endless and every form of social, educational or religious institution or activity might be quoted

as being the object of this charge. It is evident that many of the objects on behalf of which charity is alleged to be collected have no direct connection with the marketing of agricultural produce. Probably the worst feature of the present system is that these collections are by no means always utilised for their legitimate objects and apparently in many cases a good proportion is retained by the persons collecting the charge. Charity may be collected both in cash and/or kind from the sellers or buyers or both. As a rule sellers generally have to pay a percentage charge usually Re. 0-0-6 to Re. 0-2-0 per hundred rupees as *dharmada* or *gaushala* (home for animals). Over and above the usual cash charge a quantity of grain varying from $\frac{1}{4}$ seer to about 2 seers per cart may be distributed to the temple *pujari*, to beggars, etc. In some markets deductions for local religious institutions have been fixed. For instance, at Cawnpore $\frac{1}{4}$ seer per cart is payable to each of 4 institutions, viz., *Mahabir*, *Anathalya* (orphanage), *Seva Samiti* (volunteers for social service) and *mandir* (temple) and the quantity distributed to casual beggars and minor institutions is estimated at $1\frac{1}{4}$ seers per cart. The total charge works out to Re. 0-5-3 per cent (including Re. 0-0-6 paid by the buyer for *gaushala*) which is equal to 6.4 per cent of the total merchandising charges at this market.

In the Punjab this charge does not exist in 18 out of 46 markets. In the other 28 markets charity is paid by the seller in 24 instances and in the remaining four the *arhatiya* is responsible. The rate varies from Re. 0-0-3 to Re. 0-3-0 per cent, the average for 24 markets being Re. 0-1-2 per cent.

'Charity' deduction exists in all the markets of the United Provinces. In western markets of the United Provinces in 8 out of 10 it is paid by the seller, the rate varying from Re. 0-0-6 to Re. 0-2-6, the average being Re. 0-1-3 per cent. In the central and eastern markets of this province the rates are rather higher and the average of 6 markets works out to Re. 0-2-1 per cent. In 6 markets out of 16 the buyer also contributes towards this charge, his share varying from Re. 0-0-3 to Re. 0-1-6 per cent average Re. 0-0-8 $\frac{1}{2}$.

In the Central Provinces out of the 11 markets for which data are available a charity charge exists in 9. It is everywhere payable by the seller, the rate varying from Re. 0-1-8 to Re. 0-8-4 per cent the average rate for these markets being Re. 0-4-9 per cent. This is probably higher than the rate charged in any other part of India. In Bihar and Orissa 'charity' is payable both by the seller and buyer in 11 markets, the seller's share ranging from Re. 0-0-6 at Bhagalpur to Re. 0-2-6 per cent at Monghyr and for the buyer from Re. 0-1-0 at Hilsa to Re. 0-6-6 per cent at Jamalpur, the average rate for the seller and buyer being Re. 0-1-8 and Re. 0-2-4 per cent respectively. In the markets in Bombay this charge is usually taken from the seller and was found to vary between Re. 0-1-0 and Re. 0-4-0 per cent.

In the State of Hyderabad out of the 7 regulated markets 'charity' is charged only at 2, namely, Latur and Nanded, the

rate being Re. 0-0-7 and Re. 0-2-2 per cent respectively*. On the other hand it exists in 13 out of 14 unregulated markets and varies from Re. 0-1-11 per cent at Parbhani to as much as Re. 1-4-0 at Hyderabad.

(7) MISCELLANEOUS CHARGES.

The main items included under this head are market fees, bazaar *chaudhari*, *shagirdi* (fee levied by the *arhatiya* to cover the wages of his apprentice), *batta*†, *mudat*‡, payments to waterman, *chaukzāar*, cook and sweeper. Another somewhat irregular item which cannot be ignored is the gratification expected by public servants, *e.g.*, the municipal employees. In addition to these various charges which are more or less current in the great majority of markets some odd items appear in certain markets. For example, there is a charge at Gujranwala in the Punjab under the head "stable" while at Karnal in the same province an item known as *kachcha* bazaar appears in local invoices. At Muktesar a municipal water tax is charged from the seller. The miscellaneous charges detailed above are almost always payable by the seller either in cash or in kind depending upon the nature of the object for which they are levied.

Out of 46 markets in the Punjab miscellaneous charges were found to exist in 23 only, the rate varying from Re. 0-1-0 per cent at Toba Tek Singh to Rs. 1-5-0 at Ludhiana, the average for those markets in which these charges occur works out to Re. 0-3-10 per cent.

In the United Provinces miscellaneous charges of one kind or another occur at 14 out of 16 markets investigated, the total expenses varying from Re. 0-2-6 per cent at a number of the markets in the west of the province, *e.g.*, Ilapur, Shamli, etc., to Re. 0-11-0 per cent at Fyzabad. The average charge is Re. 0-5-0 per cent.

In 9 markets out of 11 in the Central Provinces where this charge exists it was found to range from Re. 0-5-4 at Saugor to as much as Rs. 1-2-7 at Pipariya. The average of these markets, *viz.*, Re. 0-10-3 per cent is far higher in this province than in Northern India.

In Bihar and Orissa, miscellaneous charges were levied both on seller and buyer, the average being Re. 0-3-11 per cent on the seller and Re. 0-2-0 on the buyer.

It may be observed that as a rule high miscellaneous charges occur in markets in which no attempt appears to have been made to improve local conditions. In the Canal Colony area in the Punjab and in western United Provinces where market practices have been

*The rules made under the Hyderabad Agricultural Market Act clearly lay down that "no fee or contribution on account of charity or for any religious purpose shall be levied on or paid by any grower of cotton or agricultural produce directly or indirectly except with the sanction of the committee".

†*Batta*—discount or exchange fee.

‡*Mudat*—literally "period". A charge made by the *arhatiya* from the seller to cover interest since he pays the seller immediately but does not receive payment from the buyer for several days.

standardised to some extent, miscellaneous items form a very small part of the merchandising expenses. In properly regulated markets there should be no occasion for ill-defined miscellaneous charges.

(8) TOTAL MERCHANDISING CHARGES IN DIFFERENT PROVINCES.

(a) *Punjab*.—The charges may best be considered in relation to colony markets and non-colony markets respectively. The existence of a large number of local trading associations or grain exchanges seems to have had a beneficial effect on trade practices, which are, on the whole, more reasonable, particularly in the colony markets, than in most other parts of India. The total market charges in the colony area, as will be seen from Appendix XXIII, vary from Rs. 2-1-3 per cent at Chak Jhumra to Rs. 3-12-3 per cent at Burewala. The average for 12 of the more important markets works out to about Rs. 2-15-1 per cent. The maximum share is borne by the seller, *e.g.*, at Burewala where it is 77 per cent. The buyer, on the other hand, bears a greater proportion of the total market charges at Sargodha thana anywhere else in the province, and about 37 per cent of the total assembling charges are borne by him at this station. It is obvious that the seller pays a larger share.

In the non-colony area of the Punjab the maximum total charge occurs at Sialkot and is Rs. 5-6-3 per cent of which the seller has to bear Rs. 4-13-3 per cent or about nine-tenths of the total. The minimum total charges are Rs. 2-4-6 per cent at Rohtak in the south-eastern part of the province. The average of 14 non-colony markets works out to Rs. 3-11-5 per cent. The minimum charge borne by the seller occurs at Abohar where out of Rs. 2-14-6 per cent the seller's share is only Re. 0-7-6 or one-sixth of the total.

The reason for the charges being heavy in non-colony markets appears to be the high rate of octroi or terminal tax levied. In the majority of colony markets a tax on arrivals does not exist, and only produce exported from the market is subject to an export toll. In the latter markets the maximum municipal charge levied on wheat was found to be Re. 0-3-0 per cent. In the non-colony markets, however, the maximum was as high as Rs. 2-12-0 per cent at Sialkot.

(b) *United Provinces*.—The variation in market customs and the range of charges are wider in this province than in the Punjab. In Western United Provinces the variation in total charges ranges from Rs. 2-7-0 per cent at Hapur to Rs. 4-12-3 per cent at Hathras. The average for 10 markets in this zone works out to a total of Rs. 3-8-0 per cent. It is significant that the seller's share is highest at Hathras where he bears Rs. 3-7-3 per cent or almost three quarters of the total charges. The minimum proportionate charge borne by the seller is at Ghaziabad where his share is Rs. 1-6-3 out of Rs. 3-9-3 per cent. The lowest total amount payable by the seller occurs at Hapur and is Rs. 1-5-6 per cent.

In Central United Provinces the charges are higher than in the west and range from Rs. 4-14-3 per cent at Banda to as much as

Rs. 7-13-0 at Bareilly. In the latter market a very high rate of octroi duty is responsible for about 45 per cent of the total charge. Lucknow has the distinction of being the second highest market in this area. The market charges here are Rs. 6-12-6 per cent of which the seller's share is Rs. 5-3-6 or more than three-fourths of the whole. In Banda, in the south of this area, the entire charges are payable by the seller alone. Charges payable in kind are also almost entirely borne by the seller. In money value the payments in kind range from Rs. 1-7-9 per cent at Bareilly to Rs. 3-2-3 per cent at Banda and on an average may be regarded as constituting about a half of the total merchandising charges in the area. In the markets of the western zone, on the other hand, payments in kind amount to only about one-fourth of the total.

In Eastern United Provinces the charges are still higher and the facilities for organised trading almost negligible. At Fyzabad and Benares the total charges amount to Rs. 7-9-9 and Rs. 7-9-0 per cent. At Fyzabad the seller bears Rs. 6-11-0 per cent or nearly nine-tenths of the total charge. Half of the charges levied on the seller in this market are payable in kind.

It will be observed that apart from the gradually increasing charges as one proceeds from west to east, the share borne by the seller rises. Payments in kind are also much more common in the eastern tracts of the province. The main differences between the total assembling charges in the east and those in the central and western zones are due mainly to the incidence of octroi, *karda* (refraction) and miscellaneous charges including payments to the waterman, *chaukidar*, beggars and the like. This will be obvious from the table given below. :—

Charges per 100 rupees in the United Provinces markets.

—					Average of 10 western markets.	Average of 4 central markets.	Average of 2 eastern markets.
					Rs. A. P.	Rs. A. P.	Rs. A. P.
Octroi	..	..	..	..	0 8 6	1 15 5	3 2 0
<i>Karda, Dhalta or Dane</i>	..	..	..	..	0 2 5	1 0 4	1 8 0
Miscellaneous	..	..	..	..	0 4 1	0 4 6	0 5 6

(c) *Central Provinces.*—The maximum charges in this province occur at Jubbulpore market and are Rs. 7-7-1 per cent. The minimum is at Drug where it is only Rs. 1-11-6 per cent. The average for the province works out to Rs. 4-10-8 per cent. Deductions for *karda*

and *dhalta* are found in most of the markets and on an average amount to Rs. 1-7-5 per cent. The custom for the *arhatiya's* commission to be paid by the buyer (*dami*) does not obtain in this province and on the whole the buyer's share of the assembling charges is comparatively low, being less than one-tenth of the total.

(d) *Bihar and Orissa*.—The conditions in this province were found to approximate to those obtaining in the east of the United Provinces. Payments in kind, and deductions for *dhalta* were common in all the markets. The total charges were found to vary from Rs. 2-4-0 per cent at Jamalpur to Rs. 5-11-6 per cent at Purnea. About half of the total charges are payable at both these markets by the buyer. It would appear that the total charges in this province are rather lower than in the adjoining market of the United Provinces. But for a proper comparison it is necessary to note that the charges for Bihar do not include expenses on cleaning and deduction for *karda*, etc., as in these markets wheat is usually handled in bags. Nor do these charges include any municipal or local board tax as none are levied in this province. A *zamindari* toll is, however, levied in many permanent and periodical markets, the latter being a special feature in Bihar and Orissa as well as Bengal. The collection of these tolls is let out to a contractor by the owner and there is every reason to state that those patronising the markets are mulcted of charges which would not be on an average less than 1 per cent.

(e) *Bombay*.—The maximum charge is Rs. 6-5-4 per cent at Bijapur and the minimum Rs. 3-15-9 at Hubli. The average for 5 markets is Rs. 5-2-10 per cent. The large difference between the maximum and minimum at Bijapur and Hubli respectively is due to the high octroi duty at Bijapur which amounts to Rs. 1-15-3 per cent. The merchandising charges are borne by the seller to the extent of 53 per cent of the total, the remaining 47 per cent being paid by the buyer. Commission is charged in the Bombay markets both from seller and buyer and the usual rate seems to be Rs. 1-9-0 per cent from each. Commission alone therefore represents more than half the total charge.

(f) *Others*.—Conditions are entirely different in other provinces and Indian States. In a number of Rajputana and Central India States for example wherever markets are controlled by local authorities, such as at Kotah or directly by the State durbar as at Dewas, the market deductions have been more or less standardised. At Kotah the total charges amount to only Rs. 2-11-8 per cent out of which Rs. 2-1-8 are payable by the seller. Charges such as *dami*, which is customary in Northern India, do not exist, but *karda* and allowances for excess weight are quite common in these parts also. At Indore, for example, the seller is debited with *karda* at the rate of $\frac{1}{4}$ seer per maund and he has to make an excess weight allowance also of half a seer per maund. The total market charges at Indore amount to Rs. 4-2-9 per cent all payable by the seller except Re. 0-6-0 per cent borne by the buyer.

Summary.—The general position in regard to the total market charges per Rs. 100 as shown in Appendices XXIII to XXX may be summarised as follows :—

				Minimum.	Maximum.	Average.
				Rs. A. P.	Rs. A. P.	Rs. A. P.
1. Punjab—						
(a) Colony Markets	..	..		2 1 3	3 12 3	2 15 1
(b) Non-Colony Markets	..	..		2 4 6	5 6 3	3 11 5
2. United Provinces—						
(a) Western Markets	..	..		2 7 0	4 12 3	3 8 0
(b) Central and Eastern Markets	..			4 14 3	7 13 0	6 12 11
3. Central Provinces	..	..	..	1 11 6	7 7 1	4 10 8
4. Bihar and Orissa	..	..	..	2 4 0	5 11 6	3 8 7
5. Bombay	..	..	..	3 15 9	6 5 4	5 2 10
3. Sind	..	..	..	3 9 9	6 0 3	4 13 0
7. Hyderabad—						
(a) Regulated Markets	..	..		2 3 6	3 2 4	2 11 6
(b) Unregulated markets	..	..		1 15 1	5 1 8	3 3 0

(9) TAXES LEVIED BY MUNICIPALITIES AND LOCAL BODIES.

Taxes levied on agricultural produce by municipalities, notified area committees and district boards generally take the form of octroi duty, terminal tax, toll or vehicle tax. In a few instances where markets are owned by local bodies, as in the Central Provinces, small sums in the shape of a market toll or fee are collected. In many of the most important assembling centres in the Canal Colony area in the Punjab, *e.g.*, Okara, Montgomery and others, municipal taxes are generally payable only on produce exported and not on arrivals. The usual rate is Re. 0-0-3 per maund which is equivalent to Re. 0-8-4 per cent assuming the current value of wheat at that point to be Rs. 3-0-0 per maund. In the eastern parts of the Punjab a tax is levied on arrivals of produce and ranges from Re. 0-0-3 per maund at Amritsar to Re. 0-0-9 per maund at Karnal. The most common rate appears to be Re. 0-0-6 per maund. Tolls are levied in 5 markets out of 29 concerning which details are given in Appendix XXXI at the nominal rates of Re. 0-0-6 to Re. 0-1-0 per cart.

In the western districts of the United Provinces the usual form in which municipal taxes are levied is a toll on each cart and pack

animal. This varies from Re. 0-1-0 per cart as at Muzaffarnagar to as much as Re. 0-14-0 per cart at Agra and is equivalent to about Re. 0-0-1 to Re. 0-0-10½ per maund respectively. In the markets of the central and eastern zones of this province an octroi charge on imports seems to be the general rule. In the 8 important markets for which details are available octroi varies from Re. 0-0-9 to Re. 0-2-0 per maund and the average charge works out to Re. 0-1-3 per maund which is considerably higher than the equivalent in the Punjab or even in the western districts of this province.

In the Central Provinces octroi is payable only in 4 out of 11 typical markets and the rate varies from 1.2 pies per maund at Khitola to 12 pies per maund at Umrer. In addition to octroi a vehicle tax is also charged in 2 markets at the rate of Re. 0-1-0 to Re. 0-2-0 per cart. In 2 other markets, *viz.*, Damoh and Itarsi, vehicle toll is paid at the rate of 3½ pies per maund or roughly Re. 0-4-0 per cart.

In the markets of Sholapur and Bijapur in the Bombay presidency octroi duty at the rate of Re. 0-1-6 and Re. 0-2-6 per bag is levied. It will be clear that in a number of markets these charges are exceedingly high. For instance, at Benares octroi forms 4 or 5 per cent of the value of the wheat. It is also commonly reported that gratification is usually paid to the municipal employees administering such taxes so that the actual figure will be considerably higher in most cases.

In order to avoid the incidence of municipal taxes many cases have occurred of markets moving to sites outside municipal boundaries. Some notable examples in the Punjab are the markets of Bahadurgarh, Sonapat, Nawanshahr, Phillaur, Nurmahal, Nakodar and Malaut.

A type of market toll which is confined almost entirely to Bihar and Bengal and to which reference has already been made is the *zamindari* tax levied by the owner of the land on which these weekly or periodical *hats* are held. In 98 of such markets in Bihar and Orissa this charge was found to vary enormously. It may be anything from Re. 0-0-3 per stall or shop to Rs. 2, or again the charge may be levied on each cart or head of cattle, the most common dues being 4 annas per cart or head. The collection of these tolls is often farmed out to a contractor if the market is a large one and the amounts actually recovered from stall holders and traders by the collector usually include something extra for the latter's pocket.

F.—Finance of assembling.

Cash in the shape of silver or other coin is the main currency in the rural areas and between the cultivator and *kachcha arhatiya*. Currency notes, probably because of their impermanence and destructibility, are less popular with the average cultivator.

(1) *Baniya*.

In practically all parts of the country the village *baniya* is the mainstay of the cultivator when the latter is in need of money or other necessities. Advances for the grower's current requirements are made mostly on personal security or, as in Sind, by verbally pledging a part or whole of the future crop. Mortgages, however,

generally form the basis of long term loans and the rates of interest are adapted to the credit of the borrower and the degree of his necessity as well as on the nature of the security offered.

In the Punjab and the United Provinces the system of *sal sawaya*, i.e., 25 per cent in the case of current loans, is a very common one. Under this system accounts are prepared by the creditor twice a year, generally in *Har* (June-July) and *Katik* (October-November) when the produce of the *rabi* and *kharif* crops is disposed of. The interest for each of the intervening periods is calculated at two annas per rupee ($12\frac{1}{2}$ per cent) and after adjusting the payments made by the debtor against the amount due plus interest, the balance, if any, is treated as principal for the next season. It may be noted that no account is taken of the date or season when a particular loan was made. The interest is calculated on the total sum thus making it higher than 25 per cent per annum. If the borrower makes any considerable repayment during the currency of the loan period, allowance is made for such repayments while calculating interest. Payments against current loans are, however, quite often in kind, and as was ascertained in Delhi by personal contact with the parties concerned, the money lender was found to under-rate the produce in such cases by one seer per rupee. The reverse is done at the time of making advances in kind. Thus the money lender makes an extra margin of 12 per cent at the current value of wheat.

In the Central Provinces the half-yearly rate of interest varies from one anna to three annas per rupee, i.e., from $12\frac{1}{2}$ to $37\frac{1}{2}$ per cent per annum. Payments are mostly in cash. In Bombay the rate of interest on similar loans is 18 to 24 per cent per annum. In Sind, it is by no means uncommon for small cultivators to obtain advances by selling their standing crop two to three months before the harvest. In such cases the buyer usually makes an advance at the rate of 8 annas per maund free of interest. Should the customary rate be exceeded the borrower is charged interest at the rate of 4 to $6\frac{1}{2}$ per cent per month, in which event the basic price is fixed at a level much lower than prevailing values. In a few cases the crop may be sold outright in advance. Except as mentioned before, the standing crops do not seem to be pledged in any other part of the country, although the practice is reported to have existed fairly widely in the 19th century.

In the case of mortgage loans or advances on the security of Promissory Notes or Stamped Bonds the transactions are mainly in cash and the rate of interest varies from 6 to 24 per cent in the case of mortgages and from 12 to $37\frac{1}{2}$ per cent for other documents. Loans are also raised on the security of ornaments or other valuables and also sometimes from merchants in the local markets. These are also required to be paid like other current loans, e.g., just after harvest.

It has been found that it is mostly in the case of small loans for current expenses that the repayments are tenaciously insisted upon by creditors just after the harvest. This often forces the liquidation of the debt by repayment in kind. These practices form one of the obstacles in the way of orderly marketing and in securing to the grower an adequate return for his produce.

(2) MERCHANTS AND COMMISSION AGENTS (*arhatiya*).

Village merchants are largely financed by the *arhatiya* or commission agent in the same village or at nearby large markets. The *arhatiyas* generally advance up to 75 per cent of the value of the wheat deposited with them at interest varying from 6 per cent in Sind to 9 per cent in the United Provinces and Bihar. Advances are also made to cultivators on similar terms.

If the produce is sold on arrival, the *arhatiya* who generally acts as middleman between the seller and the wholesale buyer, pays cash in full as soon as the weighment has been completed, but when the seller is under debt to him the outstandings are adjusted against the sale proceeds. As already noted the cultivator generally prefers to receive payment in coins. On this account a charge known as *batta*—discount or exchange fee—is levied from the seller by the *arhatiya* and may vary from Re. 0-1-0 to Re. 0-8-0 per cent but is more usually in the neighbourhood of Re. 0-3-0 per cent. The *arhatiya* himself is, however, rarely paid immediately by the buyer who is ordinarily allowed 15 days of grace. At a number of markets a charge termed *mudat* is made on the seller to cover the *arhatiya's* loss of interest for the days of grace. In many markets the *kachcha arhatiya* is paid within the days of grace allowed and in compensation for this grants to the buyer or the *pakka arhatiya* rather more liberal terms in regard to *karda* deductions or weighment.

(3) *Shroffs*.

Pakka arhatiyas and commission agents are also financed by *shroffs* or indigenous bankers. Loans may be taken on the basis of promissory notes or *mudatti hundis* at varying rates of interest depending upon individual circumstances and money market conditions. The normal range of interest is from 4 to 12 per cent per annum. These *shroffs* occupy an important place in the financial system of distribution. Their functions and methods are described in detail in Chapter IX.

(4) BANKS.

Banks do not as a rule make any advance to cultivators but loans to merchants or commission agents are generally given on the security of the stocks pledged. (See specimen agreement form in Appendix XXXII). These are not necessarily for wheat alone. Stocks of all kinds of agricultural produce are regarded as security for advances. Loans are sometimes made by the banks against stocks of *ata*, flour, etc., to the larger flour mills, but it is understood that there is little demand for such accommodation.

Stocks of grains accepted for security must be stored in places approved by the bank and are ordinarily required to be insured against fire but the bank retains the option of insuring against any additional risk which, in its opinion, is considered to be necessary to safeguard the bank's own interests. For example, in Muzaffarnagar and Chandausi in the west of the United Provinces, the produce is sometimes required to be insured against floods.

Stocks are kept under lock and key and are subject to periodical inspection by the bank's officials. In large centres a special godown keeper is employed who is assisted, where necessary, by *chaukidars*.

The bank's security consists of the pledged stocks, physical possession being ensured by the bank's lock, with its name inscribed thereon, affixed to the doors of the godowns. The bank's name-board is also usually affixed either outside on the wall of the godown or on the inside of the door.

The stocks given in pledge may be the merchant's own or stored by him on account of a client from whom he, in turn, charges interest usually at a higher rate. Advances are made only after the bank is satisfied as to the means, position, credit, respectability, etc., of the borrower and a sanctioned limit for a loan account is granted commensurate with the means of the borrower, subject to the latter hypothecating the stocks to the bank. These are not required to be "hedged" nor does the bank itself hedge stocks against which loans are made. The value of the stocks pledged is calculated on the day's rate of the market in which the advance is granted and is carefully verified by the bank manager. Advances are granted up to 75 per cent of the market value of the stocks except where the party is not of very good standing financially; in which case, not more than 65 to 70 per cent of the value of the goods is advanced. Advances are not usually made in excess of 75 per cent of the market value, and the borrower's drawing power on this account fluctuates in accordance with the market value of the commodity. In the event of a fall in price, the borrower is called upon, if necessary, to pay in sufficient funds to restore the margin of 25 per cent. In the event of a rise in the value of the stocks, the drawing power on the account may be accordingly increased within the fixed limit, but this is only done when the rise in the value of the stocks is considered by the bank to be of a somewhat permanent nature.

The demand for advances coincides with the stocking season at the end of the harvest and is heaviest from the middle of May to the end of July. Between January and March the demand is slack. Advances are repaid sometimes by instalments and sometimes against the sale proceeds of the goods but borrowers are expected to adjust their outstandings, as a rule, before the commencement of the next season and the arrival of the new season's stock. The banks are, however, usually prepared to continue to finance a reasonable carry-over of old stocks. Interest, usually at 6 per cent per annum, is calculated monthly and debited to the borrower's account. Withdrawals of stocks are allowed against deposit of funds by the borrower in his account provided the amount of the advance is always covered by 75 per cent of the market value of stocks under pledge to the bank.

In addition to advances against pledged stocks the banks help in financing the movement of the crop throughout India by remitting the necessary funds to assist purchases and by discounting demand drafts and *hundis*. The rate of interest varies according to money market conditions and the status of the would-be

borrower. The normal rate is now 6 per cent, as already mentioned, a reduction of 1 per cent as compared with 1934-35.

The extent to which the banks are patronised by the trade for the purpose of financing storage varies almost from market to market. In most of the markets of the Punjab and Western United Provinces the pledging of stocks with the banks may be regarded as a normal feature of the trade. Even where accommodation is available at cheaper rates from other sources, the banks are patronised as it saves the trader the necessity of keeping ready cash for financing his daily transactions. By pledging their stocks, traders can operate a current account with the bank drawing whenever necessary and paying interest only on the actual amount utilised. The traditional conservatism of many merchants however results in a distrust of any system which lacks the personal touch and the elasticity which usually accompanies it. The fact also that a number of formalities have to be gone into before an advance can be obtained, and the set hours during which business may be transacted, seems to deter many from availing themselves of the facilities offered by the modern banking system. Moreover the rates of interest commonly charged are not competitive, particularly in large centres where there are a number of indigenous *shroffs* or where accommodation may be obtained from a grain trading association on cheaper or less exacting terms. While it seems that the old deep-rooted aversion on the part of a certain type of *arhatiyas* to patronise the banks is gradually disappearing, many instances were encountered, in the course of this survey, of merchants who financed their stocks of produce entirely from private sources and who deprecated the idea of obtaining advances from a bank or any public institution as likely to lower their financial respectability in the eyes of their fellow traders.

(5) GRAIN TRADE ASSOCIATIONS.

In a few of the larger markets, such as Amritsar and Hapur, the local grain exchanges finance the storage of wheat out of the sums, sometimes considerable, which accumulate with them from margin money or deposits against "futures" contracts. As those managing the exchanges are usually well acquainted with the financial condition of the local traders the investment of their idle funds entails little or no risk. The rate of interest charged by these associations seldom exceeds 5 per cent. At Hapur, for example, the usual rate is $4\frac{1}{2}$ per cent.

(6) CO-OPERATIVE SOCIETIES.

With very few exceptions indeed the co-operative movement in India has developed on the lines of credit organisation. These societies ordinarily do not take any part or interest in the marketing of their members' wheat. Their chief function is to make advances mainly for agricultural expenses on the personal security of at least three members jointly and severally. These loans are generally repayable by instalments coinciding with the harvest periods of the main crops in the locality. As conditions are, the only benefit a cultivator can hope to derive from a co-operative

society is the lower rate of interest which is charged. In the different provinces it may range between 9 and $12\frac{1}{2}$ per cent.

In the United Provinces the Biswan Grain Merchants Society Limited seems to be the only organisation of its kind to make advances on the security of stored wheat. Advances are made up to three-fourths of the current market value of the produce usually at 9 per cent per annum. Both merchants and producers are members of this society.

(7) OTHER AGENCIES.

Cheap money and the virtual disappearance of the export trade in wheat between 1930-31 and July 1936 has brought about a recent development in the financing of assembling since 1934. This has taken the form of the advancing of loans on the security of pledged stocks by a large firm of grain exporters. The procedure followed is very similar to that adopted by the banks and the rate of interest ordinarily charged is 6 per cent per annum.

INTER-CHAPTER FIVE.

Having laboured for months to produce Rs. 100 worth of wheat the grower takes it to the market where he meets with the *kachcha arhatiya* and his tout, the *dalal*, the *rola* who dresses his wheat, the weighman, the *charhava* who fills the scale pan, the *ota* who holds open the mouth of the bag. These and the *munim* (the *arhatiya's* clerk), the *chaukidar*, the sweeper, the waterman, the *arhatiya's* cook and a horde of beggars of every description all regard themselves as entitled to a share of his produce. He is fortunate if by the end of a day they have only taken two or three rupees, since they are just as likely in some markets to take seven or eight rupees of his precious hundred. It is not surprising if many cultivators rather than face this appalling array prefer to sell their grain to the *baniya* or the itinerant *ghumars* and *telis* who come round the villages.

Before he reaches the market the grower has to pay, in most cases, octroi, toll or terminal tax to the municipality. In the market he has to meet charges such as *arhat* and *dalali* and be subject to deductions for *karda* (refraction) or *dhalta* and *dane* on account of weight. *Tulai* he pays actually for the weighing, *palledari* or *hammali* for handling by various people, and *dharmada* or *dharmao* on account of charity. Many of these charges are taken in kind and in taking their share the persons concerned are liable to be generous—to themselves. In the case of cash deductions also such as commission or brokerage, the customary charge is more liable to be enhanced than reduced although concessions are frequently given to the larger *zamindars*. The scale of charges given in this report must, therefore, be regarded as the minimum admitted charge in the markets concerned and it appears that in the Colony markets in the Punjab these are as low as Rs. 2-1-3 per

Rs. 100 but in the central and eastern markets of the United Provinces the total charges may amount to as much as Rs. 7-13-0 per Rs. 100. In regulated markets they tend to be lower. In Hyderabad, for example, the maximum in those markets is Rs. 3-2-4 but in the unregulated markets Rs. 5-1-8 per Rs. 100. This in itself is strong argument in favour of the regulation of markets.

The great objection to these market charges lies not only in their multiplicity but also in the fact that they are not clearly defined and specified. In every market each separate charge always tends to be exaggerated in individual cases. Some provision ought, therefore, to be made whereby the charges payable in each market should be drawn up by some market authority under rules made with the approval of the appropriate department of the local Government. The scale of recognised charges should be posted up in a conspicuous place in the market and all persons entitled to make or take charges either in cash or kind should be licensed by the market authority. In the event of any one taking more than his legitimate fee or share the licence should be suspended. It may be observed that trade associations in various markets have already done much to regularise the charges in the markets where they are operating even although growers are not represented on the association. Provided the market charges are fixed it does not seem to matter whether it is done by trade association or by instituting regulated markets for grain under the local market legislation such as already exists in Bombay, the Central Provinces, Madras and Hyderabad State.

Many of the practices current in markets should be abolished or improved. The weighing charges and deductions seem excessive and some attempt should be made to experiment with the introduction of weigh-

bridges with a view to improving conditions. A fixed deduction (*karda*) on account of impurities (refraction) which may or may not be present, seems an unjustifiable charge on growers who put good clean wheat on the market. Similarly the practice of *dara* sales by which heaps of varying quality are sold together at one price is a distinct deterrent to any effort by cultivators to improve the quality of their wheat. Sale should be by individual lots and a standard contract with mutual allowances as subsequently referred to should be adopted for "ready" sales in the markets as well as for "futures". The method of bidding under the cloth (*purdah*) has been frequently criticised and the secrecy which it involves invites such criticisms, but there would seem to be no objection to the practice if, as is commonly done in the Central Provinces, the final bid is openly declared.

If markets are to be improved particularly in regard to the layout, sanitation, regulation of charges, etc., some form of regular supervision by the municipality or the local Board is necessary. The fact that the ownership of some markets is in private hands would appear to be no obstacle to this and any regulations applied to municipal markets should be made equally applicable to those under private control.

In improving the layout of grain markets consideration ought to be given to the desirability of protecting the produce from rain during the monsoon or other times. Apparently only in one major up-country grain market, namely at Nagpur, is provision of this kind made. Were the practice more general it would partially remove one of the causes of the seasonal rush of supplies by allowing the marketing of grain to continue in some measure during the monsoon. It would at least prevent a good deal of damage which occurs from irregular and unexpected rains later in the season.

Attention needs to be drawn to the hampering effect of octroi duty, terminal taxes and tolls on marketing. These amount sometimes to 4 or 5 per cent of the value of the wheat and are generally to be paid by the cultivator. In theory of course the octroi duty should be payable by the consumers in the town in the form of enhanced prices but owing to the fact that they are in the first instance paid by the cultivator-seller who has no alternative outlet the charge comes altogether out of his pocket. Considering the fact that the amount of octroi collected in the course of the year by municipalities—mainly on agricultural produce—amounts to over Rs. 1½ crores*, the fairness of the incidence of this tax is a matter for serious investigation. That the octroi is frequently “more than the traffic can bear” is clear from the fact that in quite a number of cases markets have been driven outside municipal boundaries.

So far as the finance of assembling is concerned the larger joint stock banks are developing a growing business in making advances against stocks but this is only noticeable in certain districts and markets, and much apparently still needs to be done to make those facilities more generally available in the lesser markets.

*Statistical Abstract for British India, 1932-33.

CHAPTER VI.—CLASSIFICATION, GRADING AND STANDARDISATION.

A.—Classification.

Earlier chapters have shown the multiplicity of descriptions applied to the same or different types and classes of wheat throughout India. Apart from a little *Emmer* wheat (*T. dicoccum*) grown chiefly in the Carnatic area and known usually as *khapli*, the ordinary commercial types fall into two general groups, viz., *T. durum* and *T. vulgare*, and the big bulk of the crop may be simply classified as follows :—

<i>T. vulgare</i> ..	White	..	{	Hard	..	<i>Dara</i> (f. a. q.) or <i>sharbati</i> types
				or semi-hard.		of Northern India.
				Soft	..	<i>Dara</i> (f. a. q.) or <i>pissi</i> of the
						Central Provinces and part of
<i>T. durum</i> ..	Red	..	{	Hard	..	<i>Lal kanak</i> of the Punjab and
				or semi-hard.		generally north and west of
				Soft	..	Delhi.
						<i>Lal pissi</i> of the Central Provinces
<i>T. durum</i> ..	White	..	{			and Central India.
						<i>Bansi</i> , <i>jalalia</i> , <i>khandwa</i> and
						kindred types of the Central
<i>T. durum</i> ..	Red	..	{			Provinces, Central India and
						Deccan.
						<i>Kathia</i> of Rajputana, the Central
						Provinces; Central India and
<i>T. durum</i> ..	Red	..	{			Bijapur red of the Carnatic.

T. vulgare.—The common wheats, of which over three-fourths are white, form more than 85 per cent of the entire Indian crop. The term *sharbati* used in its wide general sense as referring to all hard or semi-hard white wheats of Northern India covers about 35 to 40 per cent of the total crop.

Pissi grown in the areas referred to represents about 25 to 30 per cent of the whole crop.

Red.—Of these the hard types occur in the Punjab and North West Frontier Province and the bulk of the semi-hards and softs in the United Provinces, Bihar and the Central Provinces. The total quantity of red wheat grown in India is probably between 16 and 20 per cent of the total production. Roughly half of the red wheat crop is soft.

T. durum.—Both the white and red *durums* constitute about 12 to 15 per cent of the crop, the former type predominating.

To a considerable extent the distinctions between *sharbati* and *pissi* and also between *lal kanak* and *lal pissi* may, for commercial purposes, be conveniently made on a geographical basis. But the differentiation between these classes and the *durums*, apart from appearance, evidently lies more closely in the density and weight per 1,000 kernels. The latter for example seems almost everywhere to be over 40 grammes per 1,000, while the *vulgares* average about 33, grammes. (Appendix XXXIII).

These different classes of wheat have different quality characteristics and different uses and price levels. A buyer who wishes to have one of these will not be satisfied if another is delivered to him instead. The first step towards bringing order out of chaos is for these six general classes to be recognised and quoted in all the markets where they are available and for traders to buy and sell on the basis of those descriptions. It would be desirable also that producers should sow seed of one or other of these types only in the respective districts and that Agricultural Departments when propagating 'improved' varieties should ensure that they are of the type most commonly found in the areas as indicated above. They should not, for example, attempt to disseminate *vulgare* wheats in tracts which are at present essentially devoted to *durum*. It is also essential that the number of varieties sown should be restricted to the fewest possible recommended types.

(1) QUALITY FACTORS.

Before discussing the question of grading it is necessary to appreciate the various complex factors which constitute quality. The chief ones are (a) impurities, the presence of which together with damaged grain may seriously affect milling quality, (b) bushel and kernel weight, (c) nature and structure of the kernel and (d) moisture content. The only factors on which the grain is at present judged by merchants in India are, firstly, the amount of impurity content known to the internal trade generally as *khad** or refraction and, secondly, its general appearance which is subject to very wide interpretation in the minds of both buyers and sellers.

(a) *Refraction* may be comprised of any one or a combination of the following :—

- (i) Dirt or foreign matter including oilseeds and non-food grains.
- (ii) Barley or other food grains.
- (iii) Damaged and 'touched' grains.
- (iv) Shrivelled or immature grains.
- (v) Weevilled grains.
- (vi) Mixtures of red wheat in white.

The presence of dust, stones, lumps of earth or mud and other foreign matter in the local produce may be due in part to the relatively primitive methods of threshing and winnowing. The admixture of other food grains and oilseeds which may at times be very considerable can be attributed to the practice of sowing mixed crops, such as wheat and gram or wheat and barley or wheat and rapeseed. Damaged or defective grain is partly due to faulty practice in preparation for market and is also the result of inefficient, inadequate or careless storage.

The proportion of impurities, and of white, red and *durum* varieties present in the wheats grown in the main producing areas of India are shown in Appendix XXII. These results have been

*Literally "manure" and hence implying something unfit or useless for consumption.

based on the analysis of 1,400 samples collected at every link of the marketing chain in all parts of India.

(i) *Dirt*.—It will be seen that the lowest average dirt content, excluding oilseeds and non-food grains, was found in the Punjab wheats. It occurred in the east and south east and the Canal Colony areas where the proportion was only .22 and .23 per cent respectively, while in the west and south west of the province it was .26 per cent. The average dirt content found in the wheat grown in the western United Provinces was .36 per cent but the maximum, *viz.*, 4.91 per cent. was very much higher than in the adjoining areas of the Punjab where the maximum was less than 1.5 per cent. Progressively eastwards the average and maximum proportions of dirt rises until it reaches .91 per cent and 5.47 per cent respectively. The highest average dirt content found was 1.97 per cent and occurred in the Central Provinces wheats. In Hyderabad (Deccan) the average was also high, *viz.*, 1.39 per cent. Other provinces in which the average exceeded 1 per cent were Bombay with 1.10 per cent, Sind with 1.12 per cent and the North-West Frontier Province with 1.02 per cent. Some very dirty samples were encountered in Bombay, Rajputana, the Central Provinces and Sind having a dirt content of as high as 9.96, 7.85, 7.49 and 6.37 per cent respectively.

Oilseeds and non-food grains.—The percentage of oilseeds in wheat shows considerable variation. The lowest average proportion was found in Bombay and was .29 per cent and the highest in the North-West Frontier Province, 1.72 per cent. The maxima ranged from 1.21 per cent in Bengal to 17.33 per cent in Central India.

Proportions of dirt, oilseeds and non-food grains in wheat.

			Average. %				Average. %
Punjab—							
Canal Colonies	..	..	1.00	Bombay	..	..	1.39
East and south east		..	1.01	Sind	..	..	2.11
South and south west		..	1.02	Bihar	..	..	2.19
North	..	..	1.34	North-West Frontier Province 2.74			
United Provinces—							
Western	..	..	1.28	Bengal	..	..	1.09
Central	..	..	1.49	Rajputana	..	..	2.54
Eastern	..	..	2.07	Central India	..	..	1.34
Central Provinces	..	..	2.57	Hyderabad (Deccan) .. 1.88			

(ii) *Barley, or other food grains*.—Barley, even if only in slight proportion, is almost always present in Indian wheat. Gram is also occasionally found but owing to gram being of a different shape and size it is a comparatively easy matter to separate it from the wheat. Barley, without the use of expensive plant is difficult to eliminate as its shape is similar to that of wheat.

*The quota of samples collected by each province or State was based on the local production.

The lowest average proportion of admixture of barley and other food grains was found in Central India (.17 per cent*). The highest average barley and other food grain content was found in samples drawn in the south and south west of the Punjab (3.32 per cent). The maximum varied from 2.11 per cent in Bengal to 41.52 per cent in Rajputana.

(iii) *Damaged or "touched" grains.*—Damaged and touched wheat is of importance particularly in certain areas and seasons. In the western districts of the United Provinces wheat is largely stored in *kachcha khattis* in which a certain amount of damage is inevitable and if, as sometimes happens when the monsoon is severe, the subsoil water seeps through into the pit from the bottom and sides serious damage to the wheat is caused. Damage is also caused by various forms of fungus diseases and other factors brought about by natural conditions over which the cultivator has no control. Wheat affected by one or other of these causes may, in serious cases, become internally damaged and quite unfit for milling. If the injury is not so serious the damage may only be superficial and confined to the tip of the grain or to the skin leaving the interior of the kernel practically sound.

In the absence of any clear definition the prevailing trade practice in regard to classifying unsound grain is very confusing. In many markets such wheat may be either treated as wholly damaged, *i.e.*, internally affected, or it may be regarded entirely as "touched", *i.e.*, superficially or slightly damaged. The tendency on the part of most buyers is to class defective grains as damaged since the customary allowances recoverable for damaged grain are heavier than for "touched". In other markets unsound wheat is classified as of no value.

At a recent informal conference between the Central Marketing Staff and representatives of certain grain associations and flour mills a clear definition was sought on this point and it was generally agreed after discussion that damaged wheat should be defined as internally discoloured grains, and slightly damaged or "touched" wheat as grains which were only externally discoloured without affecting the internal structure of the kernel.

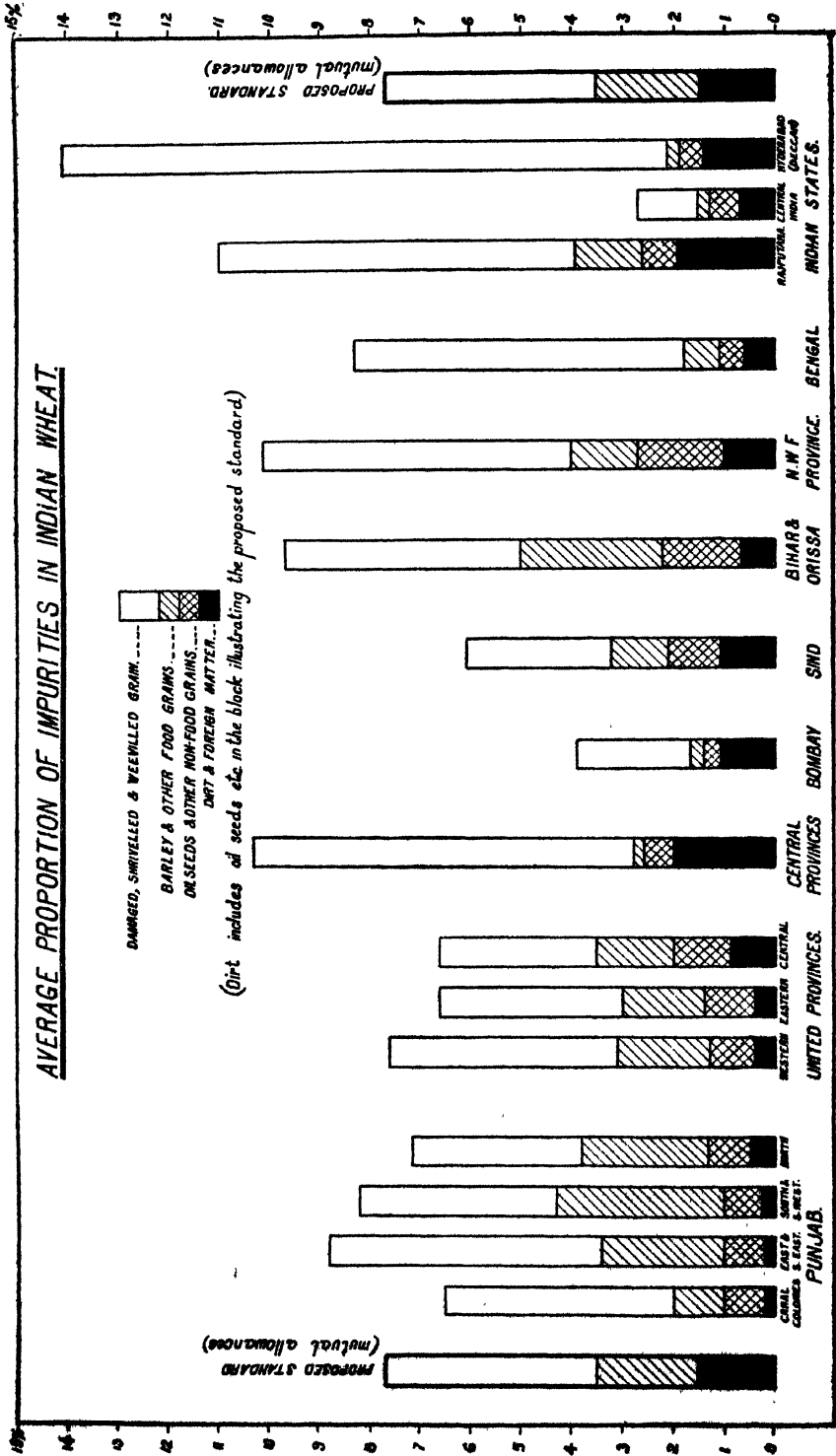
(iv) *Shrivelled or immature grains* are due entirely to drought and other natural causes. Their presence not only spoils the appearance but also detracts from the milling value of the wheat.

(v) *Weevilled grains.*—Infestation by weevil is very common three or four months after the grain has been harvested. The degree of incidence varies with the locality and the climate. It is higher in bagged wheat than when the produce is bulked because of the greater exposed surface.

The total average proportions of damaged, shrivelled or immature and weevilled grains ranged from 1.20 per cent in Central India samples to 12.04 per cent in Hyderabad. The maximum percentage occurred in a sample of the Central Provinces wheat and

*Owing to its small production Kashmir, where barley and other food grain content was only .09 per cent, has been ignored.

AVERAGE PROPORTION OF IMPURITIES IN INDIAN WHEAT.



was 58.27 per cent. This was quite abnormal and had been caused mainly by weevil attack.

Summary.—The total average proportion of refraction of all kinds found in the wheats of the various provinces and States in India are illustrated in the diagram on page 180 alongside the proposed standard for comparison and may be summarised as follows :—

Punjab—				%				%			
Canal Colonies	..	..	6.51	Bombay	..	..	3.90				
East and south east	..	..	8.79	Sind	..	..	6.14				
South and south west	..	..	8.18	Bihar and Orissa	..	..	9.68				
North	..	..	7.15	North West Frontier Province			10.06				
United Provinces—											
Western	..	..	7.61	Bengal	..	..	8.27				
Central	..	..	6.56	Rajputana	..	..	10.98				
Eastern	..	..	6.61	Central India	..	..	2.71				
Central Provinces	..	..	10.34	Hyderabad (Deccan)	..	..	14.11				

(vi) *Red wheat in white.*—The proportion of red wheat in white lowers the value of the whole if present in appreciable quantity. In the Punjab, it varies from 5.3 per cent in the Canal Colonies to 42.03 per cent in the north. In the United Provinces it ranges from 17.47 per cent in the west to 31.25 per cent in the east. In other important areas the proportion of red in white varies from 10.43 per cent in Sind to 33.41 per cent in Bihar and Orissa.

(b) *Bushel and kernel weights.*—The natural test weight of wheat is a good indication of its value and is one of the main factors used in determining the grade of the grain in all the chief producing centres of the world as well as in Europe. In India, however, this standard is not applied to wheat or indeed to any other commodity. The natural test weight of all the samples which were collected in the various provinces and States and to which reference has already been made in Chapter I, are shown in Appendix XXXIII. The average bushel weight for all types of Indian wheat is in the neighbourhood of 62 lb. and the weight of 1,000 kernels, about 33 grammes for the *vulgares* and 41 or 42 for the *durums*. On the whole, the wheats grown over the major portion of the Punjab and in the west of the United Provinces are strikingly similar in their average bushel weights. These range from 61.28 lb. in the latter area to 61.49 in the Canal Colonies. The highest average bushel weights were found in Central India wheats and were 63.18 lb. for the *vulgare* types and 63.08 lb. for the *durums*. The *durum* wheats grown in the Central Provinces show the highest maximum, viz., 66.6 lb.

Compared with the minimum bushel weight required by the Canadian and United States Grain Standards and by the standards on which Argentine and Australian wheat is tendered, Indian wheat with an average of 62 lb. per bushel ranks high. The minimum specification for No. 1 Manitoba Hard, the highest grade of Canadian wheat is 62 lb. per bushel, while No. 2 Manitoba Northern described

in the Canadian Grain Standards Act as "red spring wheat of good milling quality" is only required to weigh 58 lb. The United States statutory grades range from minimums of 51 to 60 lb. per bushel for the five normal grades of white wheat produced in that country. In the United Kingdom the Liverpool Contract Grade, although it does not admit of Indian wheat, specifies for American wheats a minimum of 60 lb. in the case of spring wheats, such as Manitoba and Northern (U. S. A.) and 61 lb. for soft winter wheats. For Argentine wheat the minimum requirements are 59½ lb. for the northern types and 60½ for the southern types, while Australian wheat must weigh not less than 60½ lb. In actual practice the average run of the best Canadian and United States hard spring wheats seldom falls below 62 or 63 lb. The North American white wheats range from 60 to 63 lb. per bushel, while Australian wheats vary from 61 to 63 lb.

The weight per thousand kernels gives a very accurate index of the size and specific gravity of the grains. The *durum* wheats stand out prominently in this respect. For example, the Central Provinces *durums* weighed 41.69 grammes on an average as compared with only 36.82 grammes for the *vulgare* types, the maxima for both these types being 55.1 and 45.6 respectively. Central India *durums* weighed 44.91 grammes compared with 38.45 for the *vulgare* types. There were considerable variations in the thousand kernel average weights of the common wheats produced in Northern India. The lowest was 31.62 grammes in the case of the east and south east Punjab wheats and the highest 34.01 grammes for the produce of the Western Punjab. The maximum for Canal Colonies wheats was 43 grammes.

(c) The *structure of the kernel* is important, since hard wheat yields a strong flour capable of greater water absorption than soft wheat. Hard, semi-hard and soft wheats are grown in the different areas as already discussed.

(d) The *moisture content* of wheat is another factor of importance. Although it is not specified in any form of standard contract used in India wheat damaged or affected by water may be regarded as unmerchantable and would accordingly be liable to rejection in every market. This contingency is covered by the phrase "sound, dry and merchantable condition" used in all contracts for export wheat and in many mill contracts. Wheat of low moisture content is profitable to the miller owing to its capacity to absorb water. In this respect Indian wheat is in the first rank. The results of tests conducted on some three hundred selected samples drawn from various areas are recorded in Appendix XXXIII and show that the average moisture content of Indian wheats is about 10.25 per cent and varies from 8.86 per cent in Central India wheats to 11.23 per cent for the produce of the Eastern United Provinces. This factor partly depends upon atmospheric humidity and is confirmed by actual mill results in Bengal where blends of Sind, the Punjab and the United Provinces wheats showed 9.75 per cent moisture content between January and June. From July to September owing to the greater humidity of the monsoon period and the fact that a large proportion of supplies makes the journey from Karachi to Calcutta by sea, the moisture content found in the blends rose to 11.5 per cent but fell from October to December—a comparatively dry period—to 10.25 per cent.

The average moisture content is below the 9 per cent mark in Rajputana and in Central India wheat of *vulgare* species. The *durum* grown in the latter area averaged 9.45 per cent. Wheat grown in the south and south west Punjab where dry conditions prevail and the crop is largely *barani* or unirrigated also shows a low average moisture content, namely, 9.05 per cent. Wheats containing over 10 per cent moisture are those grown in the United Provinces and the Central Provinces, while the highest average moisture content was found in the produce of the east United Provinces (11.23 per cent). Central Provinces, Bombay and Hyderabad (Deccan) wheats are also high in the moisture content scale. In comparison the average range of moisture content of North American wheats is from 10 to 13 per cent, that of Argentine wheat from 11 to 12 per cent and the Australian wheat about 10 per cent.

(e) *Protein and gluten content*.—Other quality factors are protein and gluten content. The results shown in Appendix XXXIII confirm on the whole the range of expectation after allowing a fairly high margin for analytical errors. The Punjab and the Central Provinces wheats as well as those grown on the Gangetic alluvium of the United Provinces and Bihar have a relatively low average protein content ranging from 8.61 in the west and south west Punjab* to 9.42 in Bihar. Areas in which the wheat grown shows over 10 per cent protein are the Central Provinces, Central India (*durums*), Hyderabad, Bombay and Rajputana. The Bengal samples analysed were *durums* which would account for the relatively high protein content of 10.79 per cent.

The average dry gluten content ranged from 7.19 in the east and south east Punjab to 12.46 per cent in the case of the Bombay *durums*. Intermediate results are shown in the wheats grown in Sind, Central India and the north and west Punjab.

B.—Grading.

Grading facilities, the dissemination of market prices and information, places market quotations on a comparable basis and renders distribution easier at all stages. Goods can be readily bought or sold on grades by telegram, telephone or letter without reference to their physical characteristics and location. They may also be sold for subsequent delivery as easily as for cash or immediate delivery. The introduction and regular use of standard grades eventually leads to uniformity in quality of production types and tends to eliminate or at least reduce the heterogeneous number of varieties many of which may be redundant or unsuitable for certain purposes. For example, the hard red spring wheat of Canada where statutory grades have long been in force is largely "Marquis" and one of the more important objects of the recently constituted Grain and Elevator Board in the Argentine, is the concentration of cultivation on fewer and better types of wheat and other crops. It should be observed at the outset that grading as recognised in most of the large wheat producing countries of the west does not exist in India, nor is there any fixed

*A few samples from the north Punjab showed an average of only 8.17 per cent, a result which is at variance with the known characteristics of the hard wheats grown in that area.

all-India standard for wheat comparable, for instance, with the standards for different classes of cotton established and controlled by the East India Cotton Association in Bombay and by the kindred body in Karachi.

(1) PRESENT PRACTICE.

Grading in large bulk with the specific object of conforming to fixed or definite standards does not take place but isolated attempts at grading of a kind are made in different ways at various stages in the preparation of the wheat for market. For example, the majority of the farmers who grow improved varieties and better quality *desi* or local wheat, thresh and keep each variety in separate heaps or lots. The cultivator also sorts out the superior from the inferior quality, sends the former to the market and consumes the latter himself. These efforts are to some extent negatived by the practice of *dara* sales which prevail so largely in Northern India and to which reference has already been made.

The retailer also makes some attempt at grading and begins where the cultivator leaves off. His method of grading depends on keeping his purchases separate, cleaning and blending, the main considerations being purity or cleanliness, structure of the grain, i.e., whether soft or hard, plumpness and general appearance. Here again the individual is entirely guided by his own experience and what one would class as a superior might be regarded by another as being in a lower category or *vice versa*.

The methods of sorting into different qualities are crude but answer their purpose to a limited extent in local areas. For instance, in the Bombay Presidency the following rough and ready system of classification is adopted by wholesaler and retailer :—

Quality Factor.	Grade No. 1.	Grade No. 2.	Grade No. 3.
Colour and lustre ..	Good and lustrous	Dull	Dull.
Uniformity of kernel size.	All grains uniform and bold.	All grains uniform	Grains not uniform.
Presence of mottled grains of uneven structure.	Negligible ..	50%	75%.
Refraction, e. g., dirt, chaff and other impurities.	1 to 2 per cent ..	2 to 3 per cent ..	4 to 5 per cent.

(a) *Sales on sample*.—In the United Provinces and the Central India the custom of selling on sample is confined to relatively few markets but it is a little more common in the Central Provinces and in the Bombay Presidency. The normal procedure is for a sample to be drawn from a cart and taken round to prospective buyers by the *kachcha arhatiya* or broker either in person, or the sample may be exposed on a bench or table in front of the *arhatiya's* shop for the

inspection of prospective buyers. The latter is the system followed at Cawnpore and Fyzabad. The bargain is struck on the basis of the quality of the sample and the buyer is morally bound to take delivery of the goods from which the sample purports to have been drawn, unless the tender is palpably inferior to the sample. In Bijapur (Bombay Presidency) it is customary for sellers and buyers to assemble in a certain part of the town at about eight or nine in the morning. The sellers bring small samples of the day's arrivals wrapped in a piece of cloth. These samples are exhibited and bargains are made without the buyer having actually seen the goods in bulk. At the conclusion of the bargaining,—the day's arrivals are usually disposed of within an hour—the carts are directed to the godowns of the buyers where delivery is effected. Sales on samples of large quantities as between distant centres are practised to a limited extent only probably owing to the lack of facilities for arbitration in case of dispute.

(b) *Sales on fair average quality.*—The *kachcha arhatiya* or broker is an instrument for effecting grading of a sort locally. His role is passive and negative in character but the fact that he undertakes group sales of lots of varying quality at a flat rate (the *dara* system) implies the averaging out of these lots into what may be termed "fair average quality" of the local market. This process reverses what the cultivator has already attempted to do, namely, to keep his produce in separate lots according to quality. The brokers' practice in fact tends to abolish all gradations of quality by reducing it to one common f. a. q. standard.

It is upon this fair average quality basis that the "futures" associations or grain exchanges originally fixed their standards and tolerances for refraction. In those markets where such institutions operate the standard tolerances are laid down in the terms and conditions of the local "futures" contracts (*see later*). These conditions are not applied to "ready" transactions and in the vast majority of markets buyers and sellers examine the goods before coming to terms which may subsequently be, as already described, subject to customary deductions such as *karda*, *dhalta* or *dane*, as the case may be.

The method of trading on the basis of fair average quality as such is not generally customary. In the Punjab and Northern India generally the fair average quality (*dara*) of each important market is, however, usually known to buyers shortly after the harvest if not during the earlier stages. *Dara* (f. a. q.) samples are frequently sent by post to their clients in nearby and distant markets by the local *arhatiyas*. The prospective buyers in other markets having examined these samples draw their own comparisons from their experience of the same markets in previous years and would feel themselves on safe ground to order their wheat accordingly. For example, it is quite normal for a merchant in Cawnpore to send an order to Lyallpur for what he would call Lyallpur *dara*. The composition of these fair average qualities or *daras* varies according to the predominating type of wheats grown in the locality and the characteristics of the local *daras* are generally known to regular buyers of grain from those districts. *Dara* transactions are not

covered by specially written contract and the telegram or letter conveying the order to buy (or sell) would be regarded as ample evidence of the existence of an agreement. Disputes, if any, as regards quality would ordinarily be settled in a court of law, for arbitration arrangements are only provided for in the contracts in vogue at large markets where there are trading associations or grain exchanges or Chambers of Commerce, of which one or other of the disputants must be members, and in mills' and shippers' contracts.

(c) *Sales on standard contracts.*—These are of three categories, viz., (i) mills' contracts, (ii) export contracts, and (iii) "futures" contracts.

(i) *Mills' contracts.*—These contracts differ only in detail and are in the main similar as regards essentials. A specimen of a typical mill delivery contract is given in Appendix XXXIV. The terms cover a description of the deliverable wheat, the quantity, the price and the source of origin. The type of bagging is specified, as also the terms of delivery, refraction and payment. An important provision is that regarding settlements of disputes. Arbitration is conducted according to the rules agreed upon between the local Grain Merchants' Association and shippers. In certain other cases the Indian Arbitration Act of 1899 is applicable. In Calcutta it is customary for arbitration proceedings to be conducted under the auspices of the Bengal Chamber of Commerce. The quality of the wheat acceptable against mills' contracts may vary. In some cases the specification as regards scales of allowances to be charged are either not clear or not stated. One mill in Delhi, for example, specifies that the wheat shall be "new, white and hard containing 85 per cent white wheat, 15 per cent red wheat, 4 per cent barley, 2 per cent thin wheat (shrivelled) and 1½ per cent dust". No stipulations are made as to the rate of deduction should the goods tendered be found to exceed the above tolerances in any respect. It is interesting also to observe that certain mill contracts specify that the wheat shall be hard or soft, as the case may be, but in practice it was found that wheat of varying degrees of texture was freely accepted. One of the mills at Sargodha stipulates that the wheat shall be soft, although it is well-known that the varieties grown locally from which the bulk of this mill's supplies are obtained are semi-hard to hard in character. In Delhi on the other hand a mill contract which specifies hard wheat covers any kind of wheat grown either in the neighbourhood or imported from the Punjab or the United Provinces. It is also significant that much of the wheat grown in the United Provinces whence the Delhi mills derive a large proportion of their supplies is, if anything, rather on the soft side. In regard to deliveries the weights and analysis as ascertained by the mill are usually taken to be final. This may or may not be effected in the presence of sellers although sellers are at liberty to be present. Various clauses are also inserted covering non-delivery or failure to deliver. The options lying with the buyer are usually (a) to cancel the contract in so far as it is unfulfilled, (b) to repurchase at the market in which the mill is located, or elsewhere, at current market rates, such quantity as was undelivered, the sellers being responsible for any loss sustained by buyers, (c) to charge seller with the difference

between the current rate and the price at which the contract was originally made, on the last day of the delivery, or (d) to grant an extension for the completion of the contract.

In regard to payments 80 per cent seems to be the usual rate advanced against "clean" railway receipts, although a number of mills also advance up to 90 per cent.

The methods of sampling and analysis are sometimes specially stipulated. Where no provision appears, the custom of the local trade is usually followed.

(ii) *Contracts used in the export trade.*—Slight differences in detail may be encountered in contracts of this type but in all main essentials the forms of agreement used by shippers and exporters of wheat are identical. Specimen of a typical "Karachi Pass" Contract is given in Appendix XXXV. This is a very common method of making purchases and implies the acceptance by the seller of the buyer's weights and analysis in respect of goods railed by him to the shipper at the port of loading* in consideration of which he may have already received an advance of anything from 80 to 90 per cent of the value of the consignment either by the shipper's agency upcountry or by the port headquarters of the firm. The balance is adjusted after the goods have passed acceptance and have been analysed and weighed over at destination.

The main conditions of a typical port pass contract stipulate the quantity of wheat purchased, its quality and source of origin and the crop year. The delivery period is stated and the type of packing—usually in brand-new B-twill gunnies of $2\frac{1}{2}$ lb. each measuring $44'' \times 26\frac{1}{2}''$. The buyers undertake to pay sellers for the value of such gunnies at a defined rate plus transportation charges for the gunnies. If on arrival of the goods in the buyer's godown it is found that the bags are in bad condition or in any way inferior to specification the buyer has the right to charge an allowance. The basis of admixture is laid down and in the event of goods tendered containing more than the stated free tolerance the buyer may either accept the goods with allowances in accordance with buyer's scale of allowances for excess refraction in force from time to time and which is known to the seller, or accept the goods and reclean the wheat at seller's expense, or accept the goods with an extra allowance to be fixed by buyer over and above the allowance according to the scale, or reject the goods claiming and recovering from seller any loss. It is also laid down that if the goods contain less than the free tolerance no allowance would be given to sellers, i.e., in other words the contract is non-mutual. The options resting with buyers in the event of failure to deliver or of short delivery or of rejection are laid down in the contract and may entail (a) the cancelment of the contract, (b) the claiming and recovery from sellers of the difference, if any, between the value at the contract price of the goods short-delivered or rejected, and the value of a like quantity of similar goods at the market rate at any centre upcountry or at the port or even in the United Kingdom, (c) to buy the

*Between half and three-fourths of the total quantities of wheat handled by shippers is normally sent on port pass terms.

equivalent quantity of wheat which has not been delivered or has been rejected and to recover from sellers the difference, if any, and (d) in the event of no goods being available in the local market buyers have the option of purchasing at the port or at any other places upcountry and to recover from sellers the difference between the contract rate and the rate of purchase, due allowance being made for differences in freight or terms of purchase. It is also laid down that goods are to be despatched at seller's expense and risk, in consignments of not less than one wagon load the railway receipt being made out in the name of the buyer both as consignor and consignee. As regards weights buyers have the option of weighing the whole parcel or of taking the average weight as customary. In taking the weights bags of more than one seer in excess of the stipulated weight are not accepted in the average. As regards terms of payment the rate at which the advance is made is stipulated the contract price being understood for absolutely dry goods. Arbitration arrangements are provided for to take place at the port headquarters of the shippers. Two arbitrators are appointed one by each party both to belong to mercantile firms which are members of the port Chamber of Commerce.

(iii) "*Futures*" contracts.—The growth of "*futures*" trading and the expansion of "*futures*" trading associations or grain exchanges in Northern India since the war, and particularly during the past four or five years (*see* Chapter IX), has, apart from defining market charges and practices, contributed towards the creation of local standard contracts for "*futures*" business. Considerable differences, however, exist between the local standards and contract terms in the different grain markets of India, and the wheat tenderable against the various contracts in vogue in these markets can vary widely as regards the proportion of dirt and extraneous matter.

The basis of refraction in use by sixteen associations in various parts of the Punjab, and the United Provinces including some of the more important institutions, are given in detail in Appendix XXXVI. The free tolerances for dirt alone will be seen to vary from "nothing free" at Bareilly and 1 per cent at Lyallpur to 3 per cent at Karachi while the rejection points range from 2 per cent at Lyallpur, Gojra, Sargodha, etc., to unspecified limits at Bombay, Bareilly, etc. The majority of contracts specify mutual allowances, *i.e.*, if the goods tendered are superior to the basis the seller is entitled to a premium, but there are also others which are non-reciprocal as, for example, the contracts in vogue at the exchanges of Ludhiana, Chandausi, Muzaffarnagar and Calcutta. As regards barley and other food grain admixture, the free tolerances range from 2 per cent at Lyallpur, Okara, Jaranwala, Sargodha, Chandausi, etc., to 6 per cent at Ludhiana. It is noteworthy that the basis for dirt and barley at Amritsar has lately been reduced from an unspecified proportion to $1\frac{1}{2}$ per cent mutual for dirt and from 6 per cent non-mutual to 5 per cent mutual for barley largely as a result of discussions between representatives of grain trade associations and the Central Marketing Staff in April 1936. Similar variations are also observed in the permissible content of damaged grain. These

range from unspecified proportions at Amritsar and Lyallpur and from "nothing free" at Jaranwala to 1 per cent non-mutual at Okara, Gojra, Sargodha, etc. The rejection limits are also unspecified in many cases. At Jaranwala the rejection limit is $1\frac{1}{2}$ per cent at Okara, Gojra and Sargodha 2 per cent and at Karachi 3 per cent. The usual tolerance for shrivelled grains is 2 per cent non-mutual but at Amritsar and Calcutta the tolerance is *nil*. The rejection limits range from the unspecified to 8 per cent at Dhuri. At Jaranwala, Okara, and Karachi the rejection limit is 6 per cent and at Sargodha 3 per cent. While deductions, if the proportion of impurities exceeds the free tolerance, are uniform as regards dirt, barley and damaged wheat content, the rate at which deductions are made for shrivelled grains varies from $\frac{1}{4}$ to $\frac{1}{2}$ the value of sound wheat. Slightly damaged or "touched" wheat is also variously treated under the terms and conditions of these contracts. The free tolerance ranges from *nil* at Jaranwala to 1 per cent non-mutual at Dhuri. The rejection limits range from unspecified quantities to 6 per cent at Karachi. The existing scales of allowances for weevilled grain also vary considerably with the different markets and with the different seasons. A number of associations have fixed scales of allowances but there are a few others, of which Karachi is a notable example, which fix tolerances for weevil from month to month and by doing so take into consideration the fair average quality of arrivals. On the whole variations in the scales of allowances for weevilled grain are greater than in the other items of refraction. As a rule new crop wheat does not contain any weevilled grain until about July and the fact is recognised by there being no free tolerance at all during May and June. Some associations have a small free tolerance of $\frac{1}{4}$ per cent during July, others have none. The scale increases progressively until the maximum free tolerance allowed occurs between December and April. Most of the associations treat weevilled grain as being half the value of sound wheat, but a few class weevilled grain as of no value at all, others again allow half value for weevilled grain up to a certain percentage and thereafter deduct full value for the excess. The rejection limits range from the unspecified at Lyallpur, Ludhiana, etc., to a maximum of 5 per cent at Dhuri. The proportions of red wheat allowed in the various contracts range from 14 per cent non-mutual at Muzaffarnagar to 30 per cent at Amritsar and the majority of the other markets. The rate at which deductions are made, if the percentage of red wheat found in the tenders of white exceeds the free tolerance, varies with each association. It may be half a pie per maund for each per cent in excess of the tolerance as at Hapur, or it may be 3 pies per maund for each 5 per cent in excess or again it may be 3 pies per hundredweight or part thereof as at Karachi. The rejection limits are usually 40 per cent but at Karachi the rejection limit is as high as 50 per cent and at Lyallpur 49 per cent. At Dhuri wheat containing more than 20 per cent is liable to rejection.

As will be seen from Appendix XXXVII, the months of delivery also vary from association to association. At the ports it is customary to quote on the basis of the European calendar. Upcountry the *Vikrami*, one of the Indian calendars, is invariably used. This tends

to cause confusion. The months of delivery vary from two in the case of Calcutta to eight at Karachi. As a rule the majority of up-country exchanges have adopted six months of delivery although there are a few with four, as for example, Hapur and Chandausi and five as at Lyallpur. Apart from other disabilities this forms an obstacle to the dissemination of market information. At Liverpool, for example, there are only five delivery months, while most of the important world markets also have the same number.

The description of wheat tenderable, the units of sale and the cover or margin money required by the associations from buyer and seller also vary considerably. The specifications are only clear in a very few cases. The units of sale and the amount of margin money are shown in detail in Appendix XLVII and range from 125 maunds to 25 tons for the former and from no deposit to Rs. 1-8-0 per bag of 2½ maunds.

Settlement dates and conditions regarding delivery were found to differ at almost every exchange. At Amritsar, for example, the submission of tenders is at the seller's option from the 16th of the month preceding due date up to 23rd day at 4 P.M. Thereafter it is the buyer's option to demand delivery up to 4 P.M. on the last day of the month. At Okara buyer and seller can demand or issue delivery orders at any time between the 15th and 2 P.M. on the 20th day of the month of settlement. At Jaranwala it is the seller's option to tender up to the 22nd day of the month of settlement. Thereafter the option rests with the buyer to demand delivery up to the last day of month of settlement. A very large number of differences could be quoted, but these are summarised in Appendix L.

In regard to the other terms and conditions governing deliveries, payments, arbitration, etc., the local contracts resemble one another on all the main stipulations although the wording and mode of expression may vary. The more important features of a typical form of contract for "futures" trading are detailed in Appendix XXXVIII.

The variation in the refraction basis from one centre to another seems to have a definitely harmful effect on the quality of the produce and even to act as a direct incentive to adulteration. For example, it appears from the analyses which have been made of a large number of samples in the Punjab that in the district markets of the greater part of the province the average amount of extraneous matter, including oilseeds, is about 1 per cent. By the time wheat from these districts arrives at Karachi, the average dirt content amounts to 1.8 to 1.9 per cent. The same type of wheat shipped from Karachi to Bombay was found to contain as much as 2.53 to 3.71 per cent of extraneous matter on an average at the latter port. In Delhi the average dirt content of Punjab Canal Colonies wheat consigned to local mills was 2.45 per cent. While the average dirt content (including oilseeds and non-food grains) of Central Provinces wheats was found at origin to be 2.57 per cent (Appendix XXII), arrivals from Saugor, Damoh and Sihora Road at Bombay over a period of one year (1935-36) showed an average of 3.41 or nearly 1 per cent more.

It is true that since there is no uniform method of sampling and analysis, results of analysis must vary. Nevertheless, the differences are so large that it seems to be a reasonable conclusion that in so far as wheats grown in these particular areas are concerned dirt is added at some stage after the produce has been brought to the market by the cultivator or primary producer.

The barley content also shows a similar variation, viz., 0.92 per cent at the point of origin, about 1.9 per cent at Karachi and as much as 3.49 per cent at Delhi.

A special investigation was conducted at Amritsar and in the surrounding districts to ascertain whether the wheat produced by the cultivators contained a high percentage of barley or whether barley was being mixed into the wheat at some stage after it had left the threshing floor. This investigation was undertaken to verify the assertion made by the representatives of the local trading associations in justification of the high percentage of barley tolerance in the local "futures" contract to the effect that the local produce did contain a sufficiently high proportion of this admixture to warrant the existing basis. Accordingly a large number of samples were collected from the threshing floors as well as from the carts bringing the wheat into Amritsar and in the Amritsar market itself and the results are shown in the following table :—

Proportion of barley in wheat.

Market.	On the threshing floor.		In consignments on the way to market.		Wheat leaving market or godowns.		In Amritsar market.	
	No. of samples.	Average %.	No. of samples.	Average %.	No. of samples.	Average %.	No. of samples.	Average %.
Ajnala	48	2.15	..	..	..	..	..	..
Amritsar	32	1.01	24	3.53	..	..	20	4.0
Taran Taran	106	0.89	..	..	..	..	..	..
Gurdaspur	33	1.6	34	1.4	28	1.89*	..	..
					9	1.7†		
					13	1.9‡		
Batala	40	2.9	..	..	5	4.64	..	..
Narowal	51	1.38	12	2.8	8	8.1	..	..
Sialkot	40	4.25	20	3.0	10	3.66	..	..
Gujranwala	40	0.89	20	1.47	10	5.08	..	..
Kamoki.. .. .	40	1.41	20	3.44	10	5.25	..	..
Average	48	1.83	21	2.60	12	4.02	20	4.0

*Booked from Sohal Station to Amritsar.

†Booked from Chhina Station to Amritsar.

‡Booked from Gurdaspur to Amritsar.

It will be observed that with the exception of Sialkot and Batala, where the percentages of barley were found to be 4.25 and 2.9 respectively, and at Ajnala where it was 2.15 per cent, the proportion of barley found in the threshing floors, was about 1 per cent, on an average, in all the other places. It may here be noted that in the case of Sialkot the better quality wheat was bought for local consumption and was, therefore, not included in these tests, hence the barley proportion is rather high. As regards the samples drawn from the carts taking wheat to the market, it will be seen that the percentage of barley has generally increased, with the exception of Sialkot and Gurdaspur, and the differences have still further widened by the time the wheat leaves the local assembling market.

(2) METHODS OF SAMPLING AND ANALYSIS.

No uniform rules or conditions are observed in India with regard to sampling methods and the minimum quantity which should be taken as representative. Bulked wheat is sampled by hand, the arm being inserted into the bulk as far as it will go and a handful or two of grain withdrawn for examination. Bagged wheat is generally sampled by a hollow spear, known in the vernacular of various parts of the country as a *parkhi*, *boma* or *bamboo*. The spear is almost invariably made of metal. The point is thrust into the different parts of the bag and each charge drawn out is examined by the prospective buyer. It is customary in some markets for 10 per cent of the consignment to be sampled. At others the proportion is less, as for example, at Hapur where three bags from every hundred are tested. The procedure varies extensively throughout the country. The selection of the bags to be sampled is usually left to the buyer but in certain markets the seller is also entitled to choose a certain proportion. In Calcutta, for instance, where sampling by spear is the customary procedure, it is the seller's right to select half the number of bags, but this right is not often exercised by sellers particularly when dealing with large shippers.

The Bombay method of sampling deserves special mention, as it prevails at more than one Malabar coast port, *e.g.*, Mormugao. The samples are drawn from 10 per cent of the consignment, the bags usually being selected by the buyer. These are then placed in a row, one standing upright, the next one on its side with the seam upwards, the third upright, the fourth on its side and so on each position alternating. The stitching at the mouth of each upright bag is cut open and the seams of those bags which are lying on their sides are similarly treated. The sampler thrusts his arm into each bag as far as the elbow and stirs the grain (or seeds as the case may be) with a circular motion performed thrice in the same direction or rotation. Having done this, the hand which is still inside the bag, is cupped at a point which is judged to be approximately in the centre of the mixed grain. The hand is now slowly withdrawn upwards care being taken not to spill any of the contents. This procedure is repeated several times until a sample of sufficient size has been obtained.

Methods of analysis, when analysis actually takes place, vary. The greater part of the wheat grown in India passes into consump-

tion unanalysed, for no system of analysis is normally practised by the *arhatiyas*, who, as already stated, settle prices on their estimation of impurities and general appearance of the grain. These traders are adept at valuing the grain by visual test but usually err in their own favour. The mills' and exporters' purchases and a proportion of the actual deliveries of wheat tendered in settlement of "futures" contracts are analysed. The analysis always takes place at the premises of the buyer, and where deliveries against "futures" contracts are concerned, in the associations' or exchanges' sample rooms where such exist.

Although local variations occur in the quantity of the sample, the sieves or cleaning equipment and the scales for the weighing of the component parts of the sample, the usual method of analysis is briefly as follows :—

The sample is carefully mixed and spread out on a flat smooth surface, usually a zinc-topped table. A number of small spoonfuls are taken up from the centre and periphery of the sample, sufficient to make up a convenient unit to work on. The dirt is sifted out, bits of stick, stones and the larger impurities are sorted out by hand and carefully weighed, usually by a chemical balance though some of the mills use small jeweller's scales or goldsmith's hand balances. Barley and defective grains are then separated by hand, each component being weighed individually. The total amount of refraction is now compared with the free allowance and if there is an excess over the tolerances deductions are calculated on the basis of the scale of allowances and the approximate dockages taken off the gross value of the wheat in the final settlement bill.

The absence of uniformity in the methods employed both in drawing samples and in making analysis, inevitably leads to differences and lack of comparability in analysis results. This in fact does happen and it is not possible under present conditions to compare the results of analysis made at Bombay with those at, say, Karachi or Amritsar, firstly, because of the size of the sample drawn, secondly because of the method of sampling itself and lastly because of the difference in procedure in making the analysis. For example, the quantity of sample drawn per tender of 25 tons is 20 seers (40 lb.) at Karachi, but at Calcutta 3 lb. or so per 10 or 12 tons is usually considered sufficient.

The obtaining of a representative sample is essential to the determination of the true grade of a given lot of grain. If the sample obtained is not representative no amount of care in analysis will establish the true quality of the grain. It seems clearly desirable, therefore, that the methods of sampling and analysis should be standardised as well as the equipment by which analysis is determined.

For example, in the United States, the Hand Book of Official Grade Standards lays down that in bulk grain in carload lots or in a wagon, at least five probes with a double shell compartment 60 inches long shall be taken or as many more at the discretion of the sampler. In case of grain in sacks no specified quantity of sample

is mentioned but it is left to the discretion of the sampler to draw samples from as many bags as he thinks fit. The equipment for separating dockage from wheat is specified among which is a set of perforated metal hand sieves which should be made of aluminium, brass or other similar material. Great stress is laid on the dimensions of the perforation of the sieves being exactly as laid down, for a slight variation materially influences the percentage of dockage obtained.

C.—Standardisation.

All-India standard contract (white wheat—sharbati).

As a first step towards the elimination of these differences and the establishment of a more uniform system of contracts an informal conference between representatives of various mills, grain trade associations and the Central Marketing Staff took place at Delhi in April 1936 for an exchange of ideas. After discussion a suggested contract was drawn up as a compromise between various standards now in vogue, a summary of which is given in the following table :—

Summary of suggested standard contract terms.

I. Dirt, including non-food grains or other extraneous matter :—

Basis $1\frac{1}{2}\%$	.. Mutual allowances at contract price up to 3%.
Over 3%	.. Double allowance plus cleaning charges.

II. Barley, Pulse and/or other food grains—

Basis 2%	.. Mutual allowances at half the contract price up to 4%.
Over 4% and up to 10%.	To be allowed for by seller at full contract price.
Over 10%	.. Buyer's option to reject.

III. Damaged and slightly damaged ("touched" and discoloured) grains :—

(a) Damaged (i.e., grains internally discoloured) :—

Basis 1%	.. Mutual—below 1% the buyer (in respect of all damaged grain present) and the seller (in respect of the difference between the basis and the actual content of damaged grain) may claim allowances at half contract price.
Over 1%	.. To be allowed for by seller at full contract price.

(b) Slightly damaged (i.e., grains externally discoloured)—

Basis 1%	.. Free—No allowance.
Over 1%	.. To be paid for by buyer at $\frac{3}{4}$ ths of the contract price.

IV. Shrivelled—

Basis 1%	..	Free—no allowance.
Over 1%	..	To be paid for by buyer at 3/4ths of the contract price.

V. Weevilled—

	Basis.	Buyer's option to reject.
April to July	.. Nil.	Over 2%
August to September	.. ½%	Over 2½%
October ..	.. 1%	Over 3%
November ..	.. 1½%	Over 3½%
December to March	.. 2%	Over 5%

Free tolerance—no allowances—up to basis percentages—differences between the basis and the rejection limit to be paid for at half the contract price of sound wheat.

VI. Red wheat—

Basis 10%*	..	Mutual.
		Excess or deficiency to be allowed for by seller or buyer respectively at 1 pie per cent per unit.

VII. Tenderable wheat—

The wheat tendered shall be any white wheat produced in India other than *durum* or white *seoni* as grown in the Central Provinces or derived from stations in the United Provinces south of Lucknow and Cawnpore. It shall be the current season (specified) crop. The wheat shall be sound, plump, clean, matured, dry and in merchantable condition weighing not less than 60 lb. per bushel. Wheat which contains injurious or poisonous seeds and has a musty or sour odour shall be liable to rejection.

VIII. Unit of weight .. Prices shall be quoted in terms of the Imperial Maund of 82-2/7 lb. (82.2857 lb.).

Additional terms for "futures" contracts.

- | | | |
|--|---------|--|
| (1) Minimum weight unit of each contract | .. | 500 mds. |
| (2) Delivery months | | May.
July.
September.
November.
January.
March. |

The date of delivery in each contract month in upcountry exchanges to be 15 days ahead of the corresponding date in Port Exchanges.

*As from 1st April 1937.

The above conditions have been circulated, not only to those associations whose representatives attended the meeting but to all the other associations which are known to be in operation at present, for their views and suggestions. From the number of replies which have been received it would appear that the greater number of the proposed changes have found favour with the Managing Committees or Boards of Directors of a large number of associations. It is hoped that arrangements may be completed for trading in the 1937-38 crop which will normally commence about May or June in 1937 to be conducted on a standard contract of all-India currency.

INTER-CHAPTER SIX.

There is a deal of loose talk about the classification, grading and standardisation of Indian produce, so much so that one would think that this step is all that is required to put marketing on a sound and efficient basis. But is there any point in all this talk ?

We have already seen in previous chapters that in certain markets certain types of wheat, *e.g.*, white *durums*, command a premium of as much as Re. 1 per maund over other wheats. Suppose a grower sees from some paper or other that white wheat is selling at these high prices in a certain market and that after allowing for freight he could apparently sell his produce there at a premium over what he might obtain in the local market. If he then sends his produce to that particular market he may later discover to his chagrin that instead of obtaining a premium over the local price, as he had hoped, his wheat is sold at a discount. He would be most disappointed. He probably did not realise, and under existing conditions could not be expected to know, that the wheat he was trying to market was a soft *pissi* type whereas the wheat which was selling at a premium was white *durum*. In order to avoid misunderstandings of this kind it is necessary in the first place to classify the different types of wheat into their various categories.

From a commercial point of view the most important type consists of the hard or semi-hard white wheats of Northern India which cover about two-fifths of the total wheat area in the country. This class of wheat may be generally recognised as “*sharbati*”. The term “*pissi*” may be used to denote the soft white wheats grown in Central Provinces and part of the United Provinces south of Cawnpore and Lucknow. Hard or semi-hard red wheat grown in the Punjab may be classified as *lal kanak* and the soft red of the Central Provinces as *lal pissi*. All these types belong to the common species

of wheat—*Triticum vulgare*. The *durums* of Central India and Central Provinces are most easily classified as white (or amber) “*bansi*”, “*jalalia*”, or “*khandwa*” and red as “*kathia*” in Central India and “*Bijapur red*” in the Carnatic.

If these different classes of wheat were recognised and generally adopted as the basis of trade description and price quotation much misunderstanding would be avoided. In the absence of this systematic classification, price quotations, however, have no real meaning from a business point of view.

Grading involves the sorting out of produce into different steps or gradations of quality. When considering the question of quality it is necessary to have in mind the quality factors required by buyers—either manufacturers or consumers. So far as wheat is concerned the great majority of final buyers want a good, hard, strong, clean, white wheat.

A sound wheat is recognised as one free from damage and shrivelled grains. Damage owing to bad storage and other conditions may affect the internal structure of the grain so as to impart a disagreeable flavour and make it quite unsuitable for milling or human consumption. The price of any particular sample must therefore be related to the amount of damaged or slightly damaged (touched) grain it contains.

Hard wheats and strong wheats are generally but not always synonymous. Hard wheat usually has a high percentage of gluten which makes the flour (*maida*) or *ata* produced from such wheat capable of absorbing and retaining a considerable amount of water whereas soft wheats are usually deficient in gluten and when made into *chapatis* readily part with their moisture and become stale much more quickly. The hardness and the strength

of wheat is related to the variety and classification already referred to but may be modified to some extent by the district and the growing condition of the season.

A clean wheat is free from dirt and impurities such as oilseeds or other non-farinaceous matter like *bhusa*. The presence of these impurities and also of barley naturally lowers the value of any particular lot. The presence of red wheat in a sample of white also involves a discount.

Grading therefore involves the sorting of wheat according to these various factors and a grower or other seller may divide his produce into different lots accordingly. Experience shows however that it very seldom pays an individual grower to go to this trouble since his produce so graded when it reaches the market sells at the ordinary market rate. This is sometimes taken as an indication that grading is not a paying proposition.

It must be admitted that in isolated individual cases this is so. Not until the market and buyers as a whole recognise certain grades as being better than others is it possible to obtain, for high quality produce, a premium over low quality. There is in fact a constant tendency for low quality to drag down the price of the high quality. In the case of *dara* sales, for example, where a number of heaps of different quality are sold all together it is evident that the high quality wheat is carrying the poor stuff with the result that the bad producer is being paid a premium for his inefficiency.

Until grades have been defined and standardised in such a way as to be made the basis of the majority of transactions between buyers and sellers the full advantage is not gained from grading. Every effort should therefore be made to introduce standard grades along with systematic classification.

The present procedure in regard to "ready" sales in country markets varies enormously. In some places, no matter how good and clean the cultivator's wheat may be, after the bargain is completed a customary deduction ('*karda*') is made on account of impurities which the wheat may or may not contain. In such markets any cultivator with a modicum of sense makes sure that his wheat is adulterated beyond the limits of the customary '*karda*'.

There are great differences also in the quality of wheat tenderable under the "futures" contracts of many of the leading grain trade associations in this country. Where the amount of refraction (impurities) allowed under a local contract is high evidence shows that the tendency is for sellers to lower the quality of the wheat until it corresponds with that allowed under the standard contract prevailing in the market so that, although the cultivators in the district concerned put good clean wheat on the market, before this reaches the final user it has been subject to a considerable amount of adulteration. This is particularly the case where the terms are non-mutual, *i.e.*, where specified deductions are made by the buyers for refraction beyond certain prescribed tolerances and there is no provision for making payments to the seller if the wheat should, in fact, contain a lower percentage of impurities than that specified in the contract. There is great need for the wider adoption of a mutual basis in wheat transactions. By making all allowances within a certain range mutual, sellers are given the best possible incentive to deliver clean and pure wheat.

The enormous variation which exists between the different contracts throughout the country makes it difficult for traders in one market to deal in another. This is now becoming generally recognised by the more progressive merchants and at a recent conference of certain representatives of grain trade associations and

milling interests with the Central Marketing Staff a fair measure of agreement was reached which may result in a standard all-India contract being adopted by the interests concerned for the 1937-38 crop. •

The proposed contract provides a uniform basis in respect of dirt, barley, damaged, shrivelled, weevilled and red wheat and in so far as the wheat tendered is of a higher quality than the basis the terms are mutual and allow for the seller claiming a better price on that account.

It may seem somewhat too advanced to apply the principle of standard tolerances with mutual allowances to "ready" sales. The terms of the proposed "futures" contract, however, having been adopted by the larger and more important buyers, it seems desirable that they should also be used in connection with "ready" wheat. It is suggested that although all the produce sold is in such cases open to inspection, the price should be fixed on the basis of the standard contract and any premiums payable because the wheat is of a higher than the basic quality provided for under the standard contract, should be paid and conversely any deductions on account of the wheat containing a greater percentage of impurities than the tolerance, should be made with reference to the actual facts of the case. Customary deductions such as "*karda*" should be abolished.

The price arrived at in the ordinary process of bargaining should be the price of standard quality wheat. Any premiums or deductions made thereafter should be related to the quality of the district especially in regard to the particular sample on offer. If this were done and this price were quoted in all markets and all publications it would be possible for growers, traders, or others to know in which market it would be possible either to buy or sell their wheat to the best advantage.

An improvement in the present classification of wheat can be most readily effected by the trade and the trade press recognising and quoting the different classes referred to above. The Agricultural Departments could also help by recognising that those commercial classes of wheat are in the main related to certain geographical areas and when they are propagating "improved" types of wheat they should have regard to the class of wheat already grown in the different districts. For example, except on very good grounds, the department should not attempt to extend the cultivation of *Triticum vulgare* in typical *durum* districts.

So far as standardisation and grading practice is concerned wholesale traders and large buyers generally through their Associations can do a great deal and they have already shown their willingness to introduce a standard contract for "futures" transactions. The application of the same standard contract terms to "ready" transactions in the ordinary country markets is desirable and it is a matter for consideration by local authorities and local trade associations whether this should be made the subject of statutory provision or left to the initiative of market committees or the trade as represented by private enterprise or producers' co-operative societies.



STORING WHEAT IN A DWELLING HOUSE IN THE HEART OF AMRITSAR CITY. THE BAGS ARE BEING CARRIED TO AN UPPER STOREY WHERE THE CONTENTS WILL BE EMPTIED INTO BULK.



MOUTH OF A BRICKLINED PIT AT CHANDAUSI.



THE *THEKKA* (EAST PUNJAB).



REINFORCED CONCRETE *KHATTIS*, OF MODERN DESIGN
(MUZAFFARNAGAR).

CHAPTER VII—CONSERVATION.

The provision of adequate and suitable storage accommodation forms an integral part of the problem of efficient marketing. The cost of storage and the losses which occur during the storage period are two of the major factors responsible for the difference between the harvest and off-season prices.

A.—Methods.

(1) IN VILLAGES.

The small cultivator throughout the country stores the wheat he retains on his holding in home-made receptacles or granaries which may be constructed either of mud or of wicker and matting prepared from straw, bamboo reeds or similar suitable material.

Kothi or gundi.—Granaries made of mud, with cowdung or *bhusa** as binding material, are generally fixtures inside the grower's house and vary greatly in size and shape according to individual requirements and local usage. Wheat thus stored is always in bulk and the quantity may vary from 2 to 50 maunds. The *kothi* or *gundi* as found in the United Provinces, the Central Provinces and Sind is usually rectangular or conical in shape and supported on mud props. There is an opening at the top for filling the grain and a small outlet hole in the side near the base. Some of the larger *kothis* have an opening in the front wall of sufficient size to permit of a person entering for the purpose of cleaning, replastering or renovating the interior.

Palli or dholi.—Containers prepared from wicker or matting by plaiting together straw, stalks, bamboos, date palm leaves, etc., are generally fixed in the courtyard of the house under the shelter of a verandah. The base of this type of receptacle is usually formed by a raised mud platform, but logs of wood and bamboo sticks are also used. The sides which are generally rounded are formed of matting plastered on both sides with a mud and cowdung mixture. Before filling with wheat or other grain a lining of *bhusa* is laid on the bottom and when filled the top is finished off with another layer of *bhusa*. The aperture through which the wheat has been poured into the container is closed either by mud plastered over the opening or by a thatch lid which is in turn overlaid with mud. This type of container is known as a *palli* in the Western Punjab and Sind, but in Bihar where the method is common the local names are *dhoh* and *bheri*. In the Central Provinces a similar practice exists and the receptacles are known also as *dholis*. In South Bihar and in Bengal round spherical receptacles are prepared from straw ropes bound on to a suitably shaped framework of sticks. These are variously named *moras*, *moraïs* or *kucheris*.

Thekka.—Another system in vogue in many of the villages in the Eastern Punjab and the Western United Provinces is to store the wheat in large cylindrical containers, made of strong closely woven hemp cloth, known in the local vernacular as *thekkas* (see plate on opposite page). These containers are open at both ends. One end may be suspended from the roof, or at a suitable height so that it

*The broken straw and chaff produced in the process of threshing.

hangs vertically. The lower end is fitted over a raised circular platform of earth covered with a layer of straw or sand. When the *thekka* has been almost filled with wheat it is sometimes topped off with more sand and the mouth is covered with another piece of hemp or gunny cloth. *Thekkas* are ordinarily placed in any convenient part of the house.

Koitha.—The larger well-to-do landowners or *zamindars* who carry appreciable stocks of wheat for sale later in the season generally set apart a portion of their own houses for the conservation of produce. Where the house has more than one storey, rooms on the ground floor are always used for this purpose. In the Punjab such accommodation termed *koitha*, is usually of burnt brick masonry construction and the wheat is generally kept in bulk. In the villages of the United Provinces and the Central Provinces where masonry is rarely employed, except by a few rich *zamindars*, and the vast majority of cultivators live in thatched mud huts such storage is *kachcha*, and is less secure from the elements than in the Punjab. In Sind, wheat held by the more prosperous ryots is frequently bagged before being stored in the *kothas*.

Khondi or bandha.—The cultivator in the Central Provinces who has large stocks conserves his wheat in an underground pit locally known as a "*khondi*" or a "*bandha*". The former are circular in shape and constructed entirely underground in places where the soil is of clay and fairly impervious to water. The latter are constructed partly below and partly above the ground on natural or artificially raised ground in the grower's compound. A *khondi* is usually *kachcha* while the *bandha* is lined with burnt brick or ordinary mud masonry. (See plates facing page 138.) The capacities of these granaries vary. A pit 5 feet deep and 12 feet in diameter ordinarily holds about 250 maunds of wheat. A lining of *bhusa* is always laid down for protection against damp.

Khatti.—In the United Provinces pit storage is not as important in the villages as in the markets. The type of pit used is known as a *khatti*. Particularly in Orissa, and in parts of Bihar, *e.g.*, in Shahabad district and in the neighbourhood of Mokameh Ghat, pit storage is fairly common but where the quantities are small the ryots keep their grain in earthen jars. The practice of storing wheat in pits is also prevalent among cultivators throughout the Bombay Presidency. These pits vary in capacity from 150 to 750 maunds according to the size of the holding and the subsoil water level.

Storage of seed wheat.—It was found everywhere that the cultivator took special care in the storing of his seed wheat. This is generally done by storing wheat with alternate layers of sand or *bhusa* to keep it safe from the effects of dampness and weevil. The village traders and *zamindars* who stock wheat for sale as seed do not make any special arrangement for the purpose. Consequently the seed supplied by these agencies is said to be of relatively poorer germinating capacity, and the cultivator, therefore, usually applies a higher seed rate for wheat obtained from these sources to allow for the proportion of grains which fail to germinate. This might possibly account for the high seed rate in certain parts of the country, *e.g.*, the United Provinces.

(2) IN MARKETS.

As a very large proportion of the crop is moved to market during the 3 months immediately after harvest the question of storage there assumes special importance. In large assembling centres wheat is either stored in godowns (*kothas*) or underground dug-outs (*khattis*). In the former both bulk and bag storage is practised, but in *khattis* the wheat is invariably stored in bulk. The pit system, however, prevails on a very large scale only in the west of the United Provinces. In other parts of India its nearest counterpart is the *khondi* of the Central Provinces, but the essential difference between the two is that while the *khatti* is fairly deep, shaped rather like a truncated cone, wide at the bottom and tapering upwards to a fairly narrow mouth or entrance at ground level, the *khondi* is a relatively shallow round trench 5 or 6 feet deep.✓

In the Punjab markets, storage takes place generally in the rooms of the lower floors of houses not being used as living quarters. Stables, covered courtyards, in fact, any sort of accommodation affording protection from the elements is used for storing wheat and produce of all kinds. In some of the newly laid-out markets of the Punjab, such as Lyallpur, special godowns have been constructed by private enterprise, but these are only superior to the ordinary godowns in that their walls are tarred for two or three feet above ground level. The wheat is stored therein both in bulk and in bags but the practice varies greatly from one part of the province to another. For example, in the Canal Colony area more than four-fifths of the local produce is stored in bags, while in the Central Punjab, where sales of full *kothas* containing 1,000 maunds or so are still common, more than four-fifths of the stocks are kept in bulk. For long term storage, however, there is a growing tendency in the important colony markets of the Punjab to conserve the wheat in bulk on account of the two-fold advantage of lower costs and less damage from insect pests.

In the United Provinces, while sack storage in *kothas* or godowns is more or less universal in large consuming markets such as Cawnpore, Lucknow, etc., the important assembling markets in the surplus areas in the western districts of the United Provinces store most of their supplies in bulk, in *khattis*. Most of these pits or dug-outs are unlined with masonry and are often situated in groups within large enclosures which may occasionally be found to contain as many as 50 *khattis*. The pavements in front of many merchants' shops also have one or two *khattis* beneath them for convenience. Brick-lined and concrete pits are in existence in a few markets only, the former in Chandausi (see plate facing page 202), and the latter in Muzaffarnagar. The storage capacity of *kachcha khattis* varies from about 250 maunds at Muzaffarnagar to 1,000 maunds at Hapur, depending upon the depth which in turn is governed by the sub-soil water level. The average *khatti* capacity at Hapur is, however, 750 maunds. At Ghaziabad and Hathras the average sized pit is about 600 and 550 maunds respectively.

The system at Muzaffarnagar calls for special comment. It was formerly the practice in this market to carry large stocks of wheat

in *kachcha khattis*, unlined with masonry, as in the surrounding markets, although the local water level in many places is from 8 to 10 feet below the surface. In 1933 the monsoon was exceptionally heavy and large quantities of wheat stored in these pits were seriously damaged to the extent, it is said, of about Rs. 4,00,000, in value. At the suggestion of Mr. N. C. Mehta, the then Collector of the district, the local grain trade association invited the Concrete Association of India to design suitable reinforced concrete chambers underground. Some 200 storage chambers or bins made of this material were constructed measuring $10' \times 10' \times 8'$, each capable of holding 450 maunds of wheat, at a capital cost of about Rs. 300 per bin. (See plate facing page 203.)

It is claimed that concrete construction helps to combat the weevil, the larvæ of which find shelter in the cracks on the floors and sides of *kachcha* and ordinary brick-walled godowns. In properly constructed concrete chambers, the smooth floors and walls are easily cleaned and disinfected and the larvæ destroyed. Apart from the possibility of weevil attack to wheat stored in ordinary *kachcha* pits, great damage may be done by rats and by damp due to seepage of sub-soil moisture. This causes the wheat at the sides and bottom of the pit to become discoloured and musty, and in extreme cases to be rendered unfit for human consumption. Wheat stored in concrete granaries suffers comparatively negligible damage from these causes. The new storage chambers of concrete which have been constructed in Muzaffarnagar are, as far as can be ascertained, the first of their kind in India and the success they have achieved may be gauged by a study of the comparative merits of the different systems of storage which are discussed in a subsequent section of this chapter.

In the markets of the Central Provinces merchants possess their own godowns which are masonry-built with flagged floors and corrugated iron or tiled roofs. The produce is usually stocked in bags but the custom in the Hoshangabad district is to conserve produce in *khondis* and *bandhas*. In the upcountry markets of Sind, where the rainfall is scanty and irregular, wheat is mostly stored in bags in *kachcha* godowns. In the rare cases where solid masonry godowns exist wheat is stored in bulk. The normal practice in the assembling and distributing markets of the Bombay Presidency and Bihar is to store wheat in bags in *kothas*. Storage in pits is, however, common in the Nasik district of Bombay. In the main consuming areas, e.g., large urban centres, wheat is stored in bags. (See plate facing page 211.)

(3) AT ROLLER MILLS.

Most of the roller mills store in their own godowns the supplies of wheat in bags as received from various buying centres. These godowns usually have cement floors and are roofed with solid masonry or corrugated iron. Occasionally, however, stocks at a mill may exceed the storage capacity of the godowns in which case the bags are stacked outside in the open in any convenient position. This can only be done with safety in the early and late winter months, when there is little likelihood of rain. One group of mills in Calcutta bulks as much wheat as space permits owing to the greater immunity which this method offers against serious damage by weevil. A

circular enclosure is formed by building a wall of bags which serves to retain the bulk wheat emptied from other bags.

(4) *At ports.*—At the ports wheat is always stored in bags, and except at Karachi, storage at all the major ports is effected in closed godowns of corrugated iron, concrete or masonry. At Karachi where rainfall is spasmodic and very low—occasionally a year may pass without any rain at all—the Port Trust has provided open-air plinths paved with flag-stones for the storage of wheat, seeds, cotton and other commodities at the Thole Produce Yard and at Kiamari, in close proximity to the wharves. This system of open air storage is somewhat unique in India. A number of these plots have, however, been roofed over by the merchants to whom they are leased, and probably one-third of the available space is now covered by light sheds open on all sides. These plots are situated in the middle of a net work of railway sidings so that the produce, as received from the interior, can be discharged from the wagon directly on to the plinth.

In Calcutta a high degree of protection is necessary owing to the severity of the monsoon. Some of the wheat arriving by sea is stored at Kantapuker in close proximity to the Kidderpore docks in large completely covered-in sheds of corrugated iron. As a rule, however, the mills, who are probably the largest local buyers and are mostly situated on the Howrah side of the river Hooghly, have their wheat discharged overside into barges for conveyance across the river to their own godowns. This saves the landing charges normally levied by the Port Commissioners. The mills' receipts by rail which are always in bags, usually arrive at Howrah and are consigned to the mills' private sidings. ✓At Bombay the system is very much the same as in Calcutta, for a similar degree of protection is essential owing to the heavy monsoon rainfall in those parts.

At these three ports storage may also be effected within the city itself in private godowns or in dwelling houses. Cost is the chief consideration and at times it has been found cheaper in Karachi to hire private godowns for long period storage. In Calcutta and Bombay where rents are high owing to congestion it is usually cheaper and more convenient to utilise the special facilities provided by the Port authorities.

B.—Costs.

(1) IN VILLAGES.

In villages the wheat is stored in the rooms and dwellings of the cultivators or village merchants. If special receptacles are used they are made by the women-folk of the household. In the United Provinces, taking into consideration the wages and cost of *bhusa*, the initial outlay in the construction of a *kothi* of 60 maunds capacity is between Rs. 8 and Rs. 9. These *kothis* may last for several seasons with careful use. In the Central Provinces the costs of constructing a *khondi* and a *bandha* of 250 maunds capacity are estimated to be Rs. 3 and Rs. 20 respectively. In Sind the cost of making a *palli* of 30 maunds capacity, which may last for five years, is about Rs. 3. *Thekkas* made of new gunnies cost from Rs. 2 to Rs. 2-8-0 while those made of hemp cloth are more expensive.

(2) IN MARKETS.

Punjab.—As already stated, wheat is usually bagged and stored in *kothas* in this province but there is a tendency to increase the amount stored in bulk especially in some of the larger markets such as Amritsar. The capacity of a *kotha* may range from 800 to 1,200 maunds, and the costs of storage comprise such items as rent, lining (*bhusa* for laying over the floor), handling charges on the wheat and depreciation of bags. The average storage period in the Punjab may be reckoned at about six months, and in certain markets such as Fazilka, in the Ferozepur district, rent is realised in advance from the prospective stockist for a minimum period of six months.

The total storage charges, based upon the data relating to the actual costs in six markets of the Punjab*, and one in Upper Sind† where similar practice obtains, varies between Rs. 9 and Rs. 19 per 100 bags of 250 maunds for six months. This works out to between 1.2 and 2.4 pies per maund per month, apart from any consideration of losses or depreciation in quality and excluding interest on capital. The average cost may be taken as about 1.8 pies per maund per month. Appendix XXXIX of which the following table is a summary sets out the position in detail regarding the cost of storing wheat in *kothas*.

Cost of storage in kothas.

					Total cost per 250 maunds for six months.	Cost per maund per month.
					Rs. a. p.	Pies.
<i>Punjab.</i>						
Amritsar	..	..	..	..	12 6 0	1.6
Moga	..	..	..	..	15 10 0	2.0
Jullundur	..	..	..	..	9 0 0	1.2
Sargodha	..	..	..	..	19 0 0	2.4
Fazilka	..	..	..	..	10 14 0	1.4
Macleodganj Road	..	..	..	..	13 7 0	1.7
<i>Sind.</i>						
Sukkur	..	..	..	..	11 13 0	1.5

The above costs may be compared with the charges levied by the operators of the elevator at Lyallpur when it was working between 1920 and 1925. The storage charge was originally fixed at .2 pie per maund per day from the beginning of the season up to 15th July and thereafter .3 pie per maund per day. This works out to 6 to 9 pies per maund per month respectively. For a normal storage period of 6 months from July to December, the incidence of storage charges at the elevator was at least five times greater than for ordinary *kotha* storage. Later this charge seems to have been reduced by half.

*Amritsar, Moga, Jullundur, Sargodha, Fazilka and Macleodganj Road.

†Sukkur.

United Provinces.—In the western districts of the United Provinces where most of the large assembling markets are situated wheat is stored underground in *khattis*, the great majority of which are *kachcha*, i.e., without masonry lining. The cost of storing 250 maunds of wheat per season in *kachcha khattis* varies from Rs. 6-10-4 at Hapur to Rs. 15 at Muzaffarnagar, but for *pakka* and cement concrete pits at Chandausi and Muzaffarnagar respectively the seasonal cost works out to Rs. 15-5-0 and Rs. 18 (Appendix XL). In some of these assembling markets, e.g., Shamli and Muzaffarnagar, where the sub-soil water level is high, bag storage in *kothas* is also common. In such cases storage costs per 100 bags (250 maunds) are reckoned to be about Rs. 17-6-10 at Shamli and Rs. 11-14-6 at Muzaffarnagar. At Chandausi where wheat is bulked in *kothas* the rent is generally about 8 annas per 100 maunds per month and the total cost per 250 maunds for a period of 4 months is about Rs. 9.

It will be seen that *pakka khatti* storage is relatively dearer than both *kachcha khatti* and *kotha* storage but taking into account the better condition in which the wheat is kept under the former system the *pakka khatti* or concrete pit eventually proves to be the most economical.

The average period of storage in *khattis* in this part of the province does not normally exceed eight months, but stocks held in *kothas* are usually cleared within four months from the end of the harvest. On this basis the cost of storage per maund per month in markets in the United Provinces may be summarised as follows :— (See also Appendices XXXIX and XL.)

	Maximum.	Minimum.	Average.
	Pies.	Pies.	Pies.
Kachcha khattis	1·4	0·6	1·0
Pakka (masonry lined or concrete) khattis	1·7	1·1	1·4
Kothas (in bags and in bulk) ..	3·3	1·7	2·4

It will be observed that *khatti* storage in the United Provinces is considerably cheaper than *kotha* storage because of the longer period during which the goods are held in store. If the *khattis* were to be used for short period storage only, costs would be correspondingly higher as the rents are payable for the whole season and the handling charges greater by about 50 per cent than those incurred in *kotha* storage (Appendices XXXIX and XL). *Khattis* are seldom, if ever, opened during the monsoon. *Kothas*, on the other hand, are used for more temporary storage to tide over the monsoon months when the pits owing to their exposed situation cannot be safely opened.

Other Provinces.—In Bihar the godowns owned privately are often situated near the railway stations. The range of rents

charged is from Re. 1 to Rs. 1-9-0 per 100 bags (250 maunds) per month. The total cost of storage including incidentals at Patna, for example, is Rs. 15-10-0 for four months which is equivalent to 3 pies per maund per month.

The costs of conservation in the wholesale markets of the Central Provinces and Bombay, where the common method of storage is in bags in godowns, are not dissimilar to the costs of *kotha* storage in the Punjab and the United Provinces. This also seems to be the case with storage in underground pits. In Piparia, an important market in Hoshangabad district of the Central Provinces, where storage in *khondis* is very common, the cost per maund per month based on an actual record of expenditure works out to 1.0 pie which exactly corresponds with the average for *kachcha khattis* in the United Provinces*.

(3) AT PORTS.

All sea trade inward and much of the rail-borne traffic to Calcutta is accommodated at Kantapuker (Kidderpore Docks) in closed transit sheds owned by the Port Commissioners. The scale of charges is 3 annas per ton (or part thereof) per week (or part) from the first to the fourth week, *i.e.*, equivalent to 5 pies per maund per month. From the fifth to the eighth week the rate is 5 annas per ton and thereafter 7 annas. Sheds may also be leased to traders in bays or sections at Rs. 60 per 1,000 square feet per month. In the city the customary charges made by the *arhatiyas* or commission agents to whom the produce has been consigned for sale is 1 anna per bag per month which is equivalent roughly to 5 pies per maund per month.

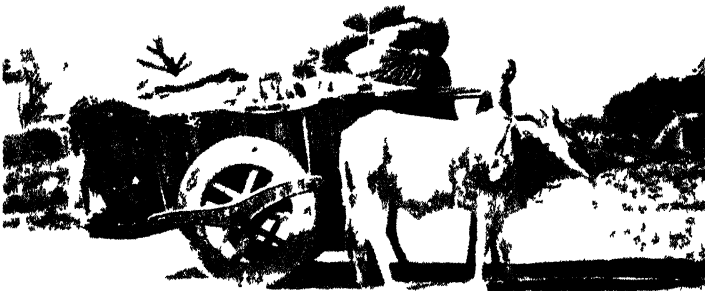
*As a typical example of the costs of *khondi* storage the following is a statement of actual expenses on 250 bags of wheat weighing approximately 625 maunds at Piparia, an important market.

Charges.		Rs. a. p.
Digging pit 12 ft. wide by 10 ft. deep and plastering the walls	.. ..	4 0 0
2,000 <i>patal</i> (leaf plates) for lining	.. ..	4 0 0
2 cart-loads of dry <i>mohwa</i> or mango leaves	.. ..	2 0 0
Transportation of 250 bags from godown to <i>khondi</i> at Rs. 3-2-0 per 100 bags	.. ..	7 13 0
Opening up bags and filling	.. ..	2 8 0
Mud for covering top (16 cart-loads) and spreading on top	.. ..	2 0 0
6 " <i>Changwars</i> " (large baskets) of <i>bhusa</i>	.. ..	1 8 0
Ramming the " cone " (4 times)	.. ..	1 0 0
Weeding top during the rains	.. ..	0 4 0
Hire of land (12 months)	.. ..	1 0 0
Watching (proportionate costs on 6 pits at Rs. 4-8-0 p. m.) for 6 months	.. ..	4 8 0
Total cost	.. ..	30 9 0

Excluding the initial cost of digging the pit the total expense of carrying this quantity of wheat over 6 months, the usual period of storage in these parts, was Rs. 26-9-0 which works out approximately to 1.3 pies per maund per month. For the purposes of comparison with the United Provinces *khatti* storage, the item of transportation charges has been omitted. This reduces the cost to the figure given above, *viz.*, 1.0 pie per maund per month.



BULK WHEAT FROM THE VILLAGE BEING UNLOADED IN A
CENTRAL PROVINCES MARKET
the cut net used

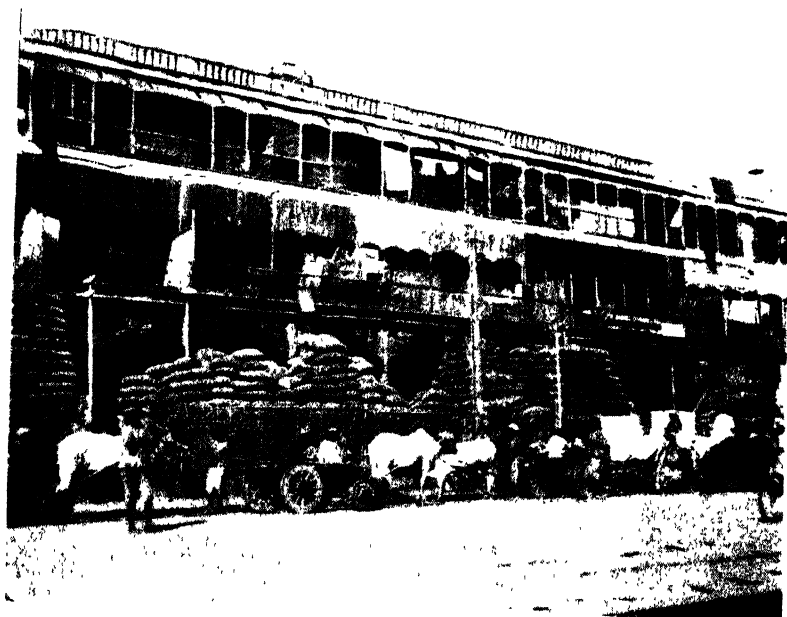


THE TYPICAL BULLOCK CART OF NORTHERN INDIA

Facing page 211.]



GRAIN ELEVATOR, LYALLPUR.



THE CHIEF WHOLESALE GRAIN MARKET—DELHI.

In Bombay, ground rent charges in covered dock storage sheds are Rs. 75 per 500 square feet per month while the rate for open yards and open sheds is Rs. 45. All goods are allowed free storage for 5 days in transit sheds and at the expiry of the free days an extra charge is levied at the rate of half wharfage which on wheat is Rs. 1-3-0 per ton *plus* a surcharge of 12½ per cent.

At Karachi no storage charges are levied but rents are levied for the plinths and sheds provided for the stacking of goods. These are fixed at 6 per cent. per annum on the value of land worked out at Rs. 12-8-0 per square yard for stacking areas and 9 per cent. per annum on the cost of the sheds *plus* actual municipal tax paid by the Port Trust on the land and sheds. At the Thole Produce Yard an additional charge on account of electric lighting at 8 pies per square yard per annum is also levied.

(4) COSTS ABROAD. (ELEVATOR SYSTEM).

Owing to the general adoption in all the other main producing countries of the elevator system and bulk handling, it is not possible to make a precise comparison of the local costs of storage with those of, say, Canada or Australia, for the reason that the rates generally quoted by the elevators are inclusive of such services as fixing quality, elevating, binning, weighing in and out. In Australia, where the wheat is sometimes consigned to the country and terminal elevators in bags the charge is an "all-in" one and includes bundling and re-consigning the empty bags back to the farmer. As an example of typical costs, the handling charge in New South Wales from farmers' wagons through country elevators to the terminal elevator has been reduced since 1935 to 1½d. per bushel (60 lbs.). This includes storage until 28th February, roughly a three-month period, as Australian wheat normally ripens about November and begins to move out by the end of November or early December. After 28th February a storage charge of ¼d. per bushel per week is levied. This would be roughly equal to 6 pies per maund per month.

(5) NOTE ON THE ELEVATOR AT LYALLPUR.

This elevator is the only one of its kind in India. (*See plate on the opposite page.*) The question of adopting the elevator system for the handling and storage of grain was mooted for the first time in India in 1879, in consequence of the development of the Indian grain trade and foreign competition. Nothing, however, happened till 1889 when it claimed the serious consideration of the Government of India. This time the movement was associated with a proposal to grant certain privileges to a private company and was vetoed by the Government in 1893. Owing to the increase in the cultivation of wheat in the Punjab as a result of canal irrigation and the consequent expansion of the port of Karachi, the question was again taken up in 1909 and an informal committee was appointed to deal with the case. The committee published its report in 1910 and recommended the construction of port elevators at Karachi but found no case for grain elevators in the Punjab.

However, as an experimental measure, the Government of the Punjab commenced the construction of a grain elevator at Lyallpur

at the end of the war. The object of building a single elevator was to obtain information which might throw light on the feasibility of instituting an elevator system in Northern India.

The main advantages claimed for the elevator were as follows :—

- (a) Safeguarding the cultivator from exploitation by providing him with facilities to take advances on grain stored in the elevator.
- (b) Economy in the handling of grain owing to the use of mechanical means as against manual labour.
- (c) Elimination of losses through damage by weevils, rats, etc., during storage.

The elevator is equipped with fairly modern machinery driven by electricity and possesses 32 bins in all with a total storage capacity of 100,000 maunds or some 4,000 tons. It was leased to a private firm of grain merchants and started work in June 1920, Government guaranteeing all running expenses up to Rs. 18,000 per annum, the total income to be paid into the local treasury and the firm operating the elevator to be held free of responsibility for all losses. The total amount of wheat received during the first season was only about 1,800 tons. All the wheat stored belonged to the local merchants and no cultivator brought his wheat direct to the elevator for storage. The amount of wheat stored each year dwindled steadily. In June and July 1925 at the height of the season, when daily arrivals in Lyallpur are seldom less than 300 tons, only 120 and 50 tons respectively, were received for binning.

The average annual income and expenditure on the elevator during the five seasons of its working were Rs. 2,452 and Rs. 19,000 respectively showing a loss of some Rs. 16,500 a year.

The storage charges were as follows :—

- (a) 9 pies per maund as cleaning charges.
- (b) Rs. 1-12-0 per 100 bags as consignment charges or 1.3 pies per maund.
- (c) Storage charges at 0.2 pie per maund per day from the beginning of the season up to 15th July and thereafter at 0.3 pie per maund per day.

This works out to 6 pies per maund per mensem which was considered a fair charge in the beginning. On subsequent experience it seems to have been reduced to 3 pies per maund.* The total in and out charges including storage do not appear to have been unreasonable when compared with these costs in other exporting countries, e.g., New South Wales.

In view of the loss incurred by Government each year, the elevator was finally closed down in 1926.

Analysing the causes of failure it seems that—

- (a) It was built at a prohibitive cost during a period of boom prices for both material and labour, its capital cost being Rs. 5 per maund of capacity. The estimate of a reliable British firm in 1926 was Rs. 2 per maund

*Cf. page 208.

capacity and it could probably be built even more cheaply at the present time.

- (b) There was general dissatisfaction about the grading of wheat done by the Superintendent who was a representative of the firm itself interested in the wheat trade.
- (c) The chief buyers of wheat in Lyallpur being the local millers who had their own arrangements for cleaning wheat, no premium was offered for the clean produce which came out of the elevator.
- (d) None of the advantages claimed for elevators were actually realised, for the wheat stored was attacked by weevils in the first year, no *zamindar* brought in his wheat for storing and the storage charges were considered too high by the merchants.

It should also be pointed out that the elevator was badly sited in a constricted area at some considerable distance from the market. The Punjab Government has from time to time tried to lease the elevator to private enterprise but without success and it has been lying idle since 1926.

C.—Loss in storage.

This is a difficult factor to assess with accuracy, for not only do methods of storage differ widely but the condition of the wheat just prior to storage also varies as regards moisture content, etc. The type and location of the granary has a direct bearing on loss during the storage period. Apart from natural shrinkage, losses in wheat may occur by weevil damage and through the ravages of rats, white ants and other vermin. Deterioration in quality is also liable to occur in pit storage as a result of the grain coming into contact with seepage water from the sides of the pit, particularly if it happens to be *kachcha*.

(1) VARIATIONS OR LOSSES IN WEIGHT.

Practical men in the trade estimate the amount of natural shrinkage to be round about 1 per cent, between the time wheat is harvested and the onset of the monsoon. Thereafter the tendency is to gain, owing to the increased humidity of the atmosphere, the amount of gain depending upon the location of stocks and the method of storage. In the Punjab where even during the monsoon months the humidity is not high the gain in weight is estimated by the trade to be between $\frac{1}{2}$ and 1 per cent. In the United Provinces where rainfall is higher the usual increase in weight may be taken as amounting to about 2 per cent for pit-stored wheat and a little more for grain stored above-ground in *kothas*. It should, however, be noted that while pit-stored wheat retains its gain in weight right up to the time the pit is opened, in the case of *kotha*-stored wheat this gain begins to disappear with the close of the monsoon. At Karachi, stocks of wheat are fully exposed to the damp sea breezes and the gain at this port may in extreme cases amount to as much as 5 per cent by the end of September. Thereafter the humidity

decreases and with the hot dry land breezes of October shrinkage sets in and the weight gained earlier begins to disappear. These facts are always taken into account in price quotations. So much so that the cost of carrying wheat over the monsoon is reckoned by some merchants to be off-set by the gain in weight.

(2) WEEVIL DAMAGE.

After the monsoon in addition to natural shrinkage the depredations of weevils are largely responsible for loss in weight. The important weevils are the *Calandra Oryzae* (*susri* or *sursali*) and the *Trogoderma Khapra* (*khapra*). The condition most favourable for their development is a warm moist atmosphere such as is commonly experienced over the great portion of the wheat producing areas from the end of June or early July until the end of September.

Wheat stored in bulk in earthen bins in the villages, as described earlier, is liable to weevil attack, as the larvæ of the weevil survive from season to season in the cracks and crevices in the walls and floors of the containers. The cultivators in the different parts of the country try to combat this source of loss by mixing up tobacco and *nim* leaves, chillies, ashes, etc., with the wheat. In Sind, the Punjab and the United Provinces the chief agents employed are sand, *nim* leaves and chillies. Onions are occasionally used in Sind. *Nim* leaves are most popular in the Central Provinces. Containers made from straw, reed matting and wicker-work were reported by many cultivators to give more adequate protection against weevil attack.

Owing to the greater exposed surface the loss from weevil is more severe when wheat is stored in sacks than when bulked. Soft varieties suffer most. It has been observed, and confirmation has been obtained during the course of this survey that *durum* and *emmer* wheats are relatively immune from weevil attack. In the Punjab, wheat stored with a protective layer of sand, top and bottom, was found to be fairly immune from heavy infestation and, therefore, the loss was very little. A number of merchants and cultivators interrogated in the Eastern Punjab stated that if the wheat was mixed with an equal amount of sand and then stored with a further protective layer of sand, damage over long periods would not exceed 1 per cent. At Shamli, an important exporting centre, in the Western United Provinces, it is the practice to sprinkle powdered lime over each layer of bags. This is supposed to protect the wheat against weevil attack.

It is noteworthy that pit-stored (*khatti*) wheat in the United Provinces is not greatly subject to weevil attack. The reason would seem to be that as the pits are dug in the form of a truncated cone narrowing upwards, the wheat in a full pit presents a very small exposed area to the air and, as weevils do not penetrate to a depth of more than 9 inches or a foot, the extent of the damage is relatively small.

In the area of intensive cultivation in the western United Provinces where large stocks are accumulated in pits and *kothas* wheat stored in the latter is usually disposed of by November in order to avoid excessive loss by weevil.

It may perhaps be of interest to compare the present methods of protecting bulk-stored wheat from insect damage in India with the suggestions of an authority in Germany where the question of protecting stocks of cereals and products against gas attack has been receiving careful consideration. It is pointed out that cereals are easily damaged by chemical warfare since they readily absorb gases and the suggestion is made that the grain should be stored in high piles, flat topped piles being avoided, and that the grain should then be covered with siliceous earth or a mixture of earth and peat. It will be observed that these recommendations do not differ very greatly from the procedure adopted in India to combat the weevil pest.

As it is obviously impossible to apportion loss or wastage in storage to the different damaging agencies with any degree of accuracy, the estimates as regards wastage from weevil infestation are based on the scales of allowances laid down by trading associations in various parts of the country. As a result of experience it may be observed that new crop wheat is generally free from the weevil attack up to July. Further the loss by this pest is greater in the town than in the villages.

In the Punjab the weevil loss is estimated as being between 2 and 5 per cent for an average period of six months storage. Where stocks are held up to the end of the season, a loss of about 8 per cent is apparently not considered unusual. The Provincial Marketing Officer of the United Provinces places the loss due to weevils between 1 and 6 per cent depending upon the period and method of storage. At Karachi after six months storage the loss due to this agency alone amounts to from 3 to 5 per cent in the case of soft wheat and from 2 to 3 per cent for the hard types.

A rough idea as to the increase in loss as the season advances may be gathered from the scale of tolerances relating to weevilled grain which some of the more important trade associations have adopted. For instance, the contract of one association at Lyallpur allows only $\frac{1}{4}$ per cent weevilled grains during *Har* (June-July). During the following months of *Sawan* (July-August), *Bhadon* (August-September), *Asoj* (September-October), and *Katik* (October-November) the maximum percentage allowed rises to 1, 2, 3 and 4 respectively. From *Maghar* (November-December) to *Magh* (January-February) up to 5 per cent is allowed and from *Phagun* (February-March) to *Baisakh* (April-May) up to 6 per cent.

At Okara, another important market in the Punjab, the local contract basis for weevilled grains varies from $\frac{1}{4}$ per cent. during *Har* (June-July) to 2 per cent after *Bhadon* (August-September), the rejection limit in all cases being 4 per cent.

At Karachi the scales are settled from month to month by the Joint Grain and Seeds Committee in accordance with the actual condition of local stocks. The free tolerances during the 1935 and 1936 seasons ranged from $\frac{1}{4}$ per cent in August to 2 per cent from November to April and the rejection limits for the same periods varied from 1 to 6 per cent respectively. The Calcutta contract

allows a free tolerance of 3 per cent in all deliveries from July to May.

A compromise between the various conditions obtaining in different parts of the country was arrived at recently when an informal meeting between the representatives of a number of important grain trade associations and the Central Marketing Staff agreed to the following scale of tolerances and rejection limits governing weevilled wheat. This fairly accurately reflects the minimum and maximum degrees of loss or wastage likely to occur under normal or average conditions.

					Free tolerance.	Rejection if over.
April-July	..	..	..	..	<i>nil</i>	2%
August-September	..	..	..	..	1½%	2½%
October	..	..	..	..	1%	3%
November	..	..	..	..	1½%	3½%
December-March	..	..	..	..	2%	5%

If the loss during these different periods be taken as midway between the respective limits of the free tolerance and rejection point, the total weevil damage from harvest to harvest incurred on the 5 million tons which are estimated to enter the trade, works out to approximately 106,000 tons representing rather more than 2 per cent of the total quantity. Exporting firms, it may be observed, assess the loss from weevil at about 2½ per cent.

Regarding the wastage in the village, the cultivator, as already stated, generally takes better care of his supplies, and particularly his seed wheat, than the trader. Moreover, the quantity retained by the producer is not carried over long periods and consequently the loss during storage, at source, is relatively small. These circumstances also apply to the casual or landless labourer, whose wages, usually paid in kind, have been reckoned to account for 500,000 tons. Most of this wheat is consumed a month or two after the harvest. The quantity really affected by weevils is, therefore, that which is stocked by the large *zamindars* or *malguzars* and the village trader. Out of a total of some 4½ million tons estimated to be retained on the holding or in the villages for seed, barter, wages in kind and all other purposes, probably not less than 2 million tons are held by these agencies with whom the general conditions of storage are very similar to those obtaining in the large wholesale markets. Applying the same rate of loss as has been taken for the 5 million tons entering trade, *viz.*, 2 per cent, the wastage at this point would be about 42,000 tons.

The total wastage due to this pest in the country as a whole seems, therefore, to be not less than about 150,000 tons representing 1.6 per cent of the average crop. In terms of value based on average up-country prices for 1935-36, this loss may be expressed at about Rs. 97 lakhs.

(3) DAMAGE BY DAMP.

As a rule only wheat stored in *kachcha* underground pits is liable to damage by damp. In the United Provinces markets where

the underground system of storage prevails most extensively, enquiries regarding the actual amount of damage suffered by wheat stored in pits as a result of contact with damp show that at Hapur the percentage of wholly damaged grain separated from the pit-stored wheat between October and April varied from 1.2 to 1.5. At Muzaffarnagar in *kachcha* pits opened in February and March the proportion of damaged grain amounted to 1.7 per cent. On the other hand, in the new concrete pits in this market the wheat affected was less than 0.1 per cent. In the *pakka* (brick lined) pits of Chandausi the actual loss was found to be in the neighbourhood of 1 per cent. At Shamli the corresponding figures ranged from 0.5 to 1.7 per cent.

In addition, however, to the internal and superficial damage, wheat stored in *kachcha* pits develops an obnoxious musty smell, and in Hapur, probably the largest wheat market of the United Provinces, a fixed discount of 4 annas per maund is allowed by the trade on old pit-stored wheat tendered after March (*Chait*). This includes an allowance for damaged wheat known as *bhagar*, all of which has to be accepted by the buyer of the pit according to local usage. In this respect also the improved system of storage in concrete pits at Muzaffarnagar shows an advantage. The owner of wheat so stored not only benefits on account of the lower proportion of damaged grain but his produce does not develop the unpleasant smell normally associated with *kachcha* pit storage and it consequently fetches a premium of about $1\frac{1}{4}$ annas per maund over the *kachcha* pit-stored wheat.

Owing to the incidence of floods during the monsoon and for other obvious reasons it is difficult to arrive at an accurate estimate as to the total loss due to damp in the country on the whole. In the large assembling markets in the west of the United Provinces where more than 100,000 tons are annually stored in *khattis*, the discount for damaged wheat (*bhagar*) would, under normal conditions, amount to roughly Rs. 20,000 annually taking the rate of damage at a conservative figure of 1 per cent and valuing it on the customary basis of one-third of the price of sound wheat. The discount for the obnoxious smell which *khatti*-stored wheat develops is usually 6 pies per maund and represents roughly Rs. 85,000.

(4) VERMIN ATTACK.

Rats are also the cause of much loss to stored wheat. Rodents, unlike weevil, commence their depredations right from the threshing floor and continue until the wheat eventually enters into consumption. In port centres like Calcutta and Bombay a constant warfare is being waged by special staffs to destroy the pests chiefly by fumigation with cyanide gas. In other areas outbreaks of plague give rise to spasmodic campaigns for the elimination of rats but apparently no general effort is made to organise systematic "rat weeks" as in England. It is impossible to estimate the amount of damage done by this pest throughout the country. White ants cause considerable loss in Upper Sind markets, and the damage done to bulk wheat is greater than that to wheat stored in bags. Estimates from a wide range of sources place the amount of this loss at pro-

portions varying from 1 to 5 per cent. Probably it will be regarded as only a conservative estimate to reckon the average loss to the total crop at something between 1 and 2 per cent.

(5) TOTAL VALUE OF LOSSES.

The estimates arrived at in the previous sections place the total wastage caused by weevil at a minimum of roughly 150,000 tons or 1.6 per cent of an average crop. Loss by damp can only be assessed in terms of value and where a customary basis of allowances exists as, for example, in the markets in the west of the United Provinces, it is possible to arrive at some kind of approximation. It appears that in this area alone rather more than Rs. 1,00,000 are conceded by sellers in the shape of discount* for deterioration. It is impossible to say what allowances are recovered in other centres. Loss by vermin attack has been reckoned to account for anything between 1 and 2 per cent of the total crop and would represent an average of 150,000 tons. The total wastage, therefore, from these major causes amounts to about 3 per cent of the total crop from harvest to harvest. Some confirmation of this estimate may be seen in the outturns of wheat stored at Chandausi (United Provinces). Actual records covering 30 *kothas* originally filled with 34,733 maunds of wheat showed that after clearance at various times from September to April there was a shortage of 1,032 maunds which is roughly equivalent to a loss of 3 per cent. It is significant that, had the entire quantity originally filled been held over until March or April, the shortage would inevitably have exceeded 3 per cent.

All the evidence, therefore, tends to show that the conservative figure of 3 per cent may be reckoned as the minimum seasonal loss. In terms of quantity this can hardly be much less than 300,000 tons which expressed in current values† represents about 2.4 crores of rupees.

D.—Comparison between different methods of storage.

The relative merits of the different methods of conservation adopted may be gauged by comparing the costs after having regard to losses or wastage and deterioration in quality. For the sake of proper comparison the storage costs should refer to large assembling and stocking centres where the systems adopted are diverse and likely to be fairly representative of conditions throughout India. Such centres are to be found in the west of the United Provinces where large scale conservation is practised in bulk and bags both in pits and above ground, and the important market of Muzaffarnagar may be taken as a typical example for the purpose of giving a detailed analysis of the costs of various systems of storage, particularly as this market possesses the only system of storage in cement-concrete pits.

The three methods of large scale conservation already described are bulk storage underground and bulk or bag storage in *kothas* or

*At 6 pies per maund.

†Average of August-September (1936) prices at Lyallpur and Hapur. (Rs. 2-15-0 per maund).

godowns. The relative costs based on actuals, of storing 250 maunds of wheat at Muzaffarnagar for 8 months—the average period for which wheat is held in the western districts of the United Provinces—are shown in detail in Appendix XLI of which the following table is a summary :—

	Pits.						Kothas.					
	Concrete.			Kachcha.			(in bulk).		(in bags).			
	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
1. Storing charge	18	0	0	15	0	0	10	7	6	15	14	6
2. Loss in storage.. ..	..	..	..	..	..	..	15	10	0	31	4	0
3. Discount for dampness or deterioration in quality ..	..	..	..	19	8	6	3	14	6	7	13	0
Total	18	0	0	34	8	6	30	0	0	54	15	6
Less for gain in weight ..	3	2	0	12	8	0	..	..	..	..	..	..
Total net cost	14	14	0	22	0	6	30	0	0	54	15	6
Equivalent per maund per month (pies)	1.4	..	..	2.1	..	..	2.9	..	..	5.3	..	..

It is clear, therefore, that storing in underground concrete pits is the most economical proposition in spite of the fact that the total actual storing charges are higher than those incurred in other methods. Although the cost of material (*bhusa*) for lining and the filling and emptying charges are lower in the case of wheat stored in concrete pits, the item of rent is almost double that of *kachcha* pits and *kothas* and is responsible for the greater cost. All the concrete granaries in Muzaffarnagar belong to the local Grain Trading Association or Chamber of Commerce and they originally cost approximately Rs. 300 each to construct, a sum far in excess of the cost of digging a *kachcha* pit. The item of rent has been calculated at Rs. 15 for 250 maunds on the basis of Rs. 27 per season for the total carrying capacity of a pit (450 maunds). This latter charge is inclusive of Rs. 2, a contribution for certain social services, the present object being to build a females hospital. The actual seasonal charge for storage fixed by the Chamber of Commerce, is therefore Rs. 25 per pit, which, having regard to the normal returns on other landed property in the same market, is excessive and could well be reduced to Rs. 18. The object, however, of charging this relatively high rental is to enable the owners to recover their capital outlay as speedily as possible and the fact that even at these enhanced rates all the available accommodation is filled immediately after the harvest, points to the success of this enterprise.

Compared with net costs in other important markets, with possibly the single exception of Hapur, concrete pit storage for long terms works out cheaper. At Hapur the nature of the soil is said to lend itself to the construction of underground dugouts and the fact that the number of pits at Hapur is the largest and have the greatest capacities of any in Northern India seems to bear this out. During the war and immediate post-war boom period the number of pits at Hapur and elsewhere, expanded rapidly until

there were and are still to-day, some 2,500 pits in Hapur itself. Of these probably less than one-half have been regularly filled in recent years and in consequence local rentals have fallen heavily until they are, at Rs. 6 per pit of about 700 to 800 maunds capacity, the cheapest not only in the United Provinces but probably in other parts of India. The total cost of storing wheat at Hapur on the basis of a 250 maunds unit for 8 months is Rs. 6-10-4 to which should be added Rs. 17-7-6 the customary discount for quality deterioration less Rs. 12-8-0 adjustment for gain in weight at 2 per cent. The net total cost, therefore, amounts to Rs. 11-9-10 as compared with Rs. 14-14-0 for concrete pits at Muzaffarnagar. If the rentals of the latter, however, were based more on local conditions and actual costs, there can be no question as to which system would be the cheaper or more efficient.

Mention has already been made of the seasonal terms which invariably apply to the letting of all types of pits but this does not prevent the lessee from using the pit for short term storage or for broken periods within the season. Under the latter circumstances the costs of storage would obviously rise in proportion as the period was shorter. For short term storage, concrete pits, by reason of the high rental charges, are by no means the cheapest. Further, wastage by weevil infestation normally commences only after July, hence the protection afforded by concrete pits against this source of loss is hardly necessary if it is only intended to keep the wheat for two, three or even four months. The net cost of different methods of storing 250 maunds for 4 months at Muzaffarnagar are also shown in Appendix XLI from which it will be seen that for short periods the four systems completely change their relative positions. Bulk storage in *kothas* costs Rs. 4-14-6 and turns out to be the least expensive. Bag storage at Rs. 11-2-0 is the next cheapest. Concrete pits storage works out to Rs. 16-7-0 and *kachcha khattis* are the dearest at Rs. 21-4-0. For short periods, therefore, bulk storage in *kothas* gives the best results, as apart from low in-and-out charges, the wheat so held can be more conveniently and safely handled, particularly during the monsoon when the unsheltered situation of the pits renders their opening a procedure attended by a certain amount of risk. There seems no reason, however, why the latter objection should not be removed by roofing over compactly arranged concrete pits of the Muzaffarnagar type although this would be impossible in the case of the isolated *kachcha* pits of other districts.

E.—Storage costs in relation to the seasonal fluctuation in prices.

The cost of conservation is one of the factors which determines post-harvest prices. Lower costs would tend to reduce seasonal price differences and thereby benefit both producer and consumer. In the previous sections storage costs have been shown to vary considerably from district to district and according to the different methods practised.

That the purchase of wheat at harvest time and holding it for a period is normally profitable is shown in Appendix XLII. Having regard to the current rate of return on investments in general, the average rate of net profit earned by wheat stock-holders is apparently high and (over and above 8 per cent interest allowed on capital)

ranges from 5.4 per cent to 15.3 per cent per annum according to the market and type of storage adopted. Occasional years may be unprofitable from the stock-holder's point of view owing to abnormalities in the season or general market conditions, but such losses are offset by "hedging" on the "futures" markets which exist in the large centres where stocks are held.

It would appear that the pronounced seasonal decline in prices which takes place shortly after harvest could be substantially reduced at the same time allowing a very fair margin of profit to the holders of stocks.

It is not possible to generalise for all markets but to take one example, say, Chandausi where the average harvest price for the period 1931/35 was 21 per cent or Re. 0.8-1 per maund below the post-harvest peak in February, and the approximate cost of storage in *khattis* (including 8 per cent interest) over a period of 8 months works out at 10 per cent of the harvest prices, the average rise in price over the usual clearing months, December, January and February amounted to Re. 0.6-1.0 per maund or 17.7 per cent leaving a clear margin of 7.8 per cent in 8 months, equivalent to 12 per cent per annum.

As already shown, the concrete Muzaffarnagar type of storage results in a saving in costs over *kachcha* pits—mainly owing to reduced wastage—amounting to $1\frac{1}{4}$ per cent. In the calculation of costs referred to above 8 per cent has been allowed on capital since banks normally advance only on 75 per cent of the value at 6 per cent and stock-holders may have to pay more on the market for the balance. With reliable storage and if the stocks are adequately "hedged" on the "futures" markets, it should seem possible to obtain funds at, say, 5 per cent on 85 per cent of the value. This would reduce the costs by another 1 or $1\frac{1}{2}$ per cent. The net trading margin would then be increased to 15 or 16 per cent per annum.

Although the present margin of profit is high the risks are also high, but with risks of damage and price risks reduced to a minimum through reliable storage and "futures" markets such a high rate of net profit must inevitably become unstable. It would attract investors who would be prepared to pay more for the growers' wheat at harvest time or alternatively growers themselves would find sufficient inducement to co-operate for storing and holding their wheat in the central markets until the harvest depression had disappeared.

A society of producers formed merely for the purpose of storing and holding wheat off the markets temporarily is, judging by the experience of other countries, likely to get into difficulties by holding too much wheat for too long a period until in the end it is left with an unsaleable surplus. For such a society to be successful it would have to pursue an extensive and active sales policy.

In India unfortunately co-operative trading in wheat, as will appear later, is largely confined to local trade. It would mean something like a revolution in the present system of co-operation before societies of producers would be capable of offering wheat for sale regularly in the distant consuming markets throughout the country.

F.—Total storage accommodation.

No records of stocks are kept at any of the markets in India with the exception of one or two of the larger assembling centres such as Hapur or Muzaffarnagar in the west of the United Provinces where pit storage is a normal feature. Even in such cases the records are incomplete as they represent only the stocks held in pits registered with the local Grain Trading Association by members for the purpose of possible tender against "futures" deliveries. In the Punjab where storage in *kothas* is largely practised no records are maintained by any of the associations.

It should be borne in mind that the amount of accommodation utilised for grain storage in this country is extremely elastic. In Europe, America, Australia and in most other countries the storage of grain is localised in warehouses or elevators specially built for the purpose and situated usually in close proximity to rail and shipping facilities. In India, however, similar conditions exist only at the major ports, and there also to a relatively limited extent. In Karachi, for example, wheat may at times be stored in large quantities not only in the port authority's sheds near the harbour but also in godowns scattered about in the city. In the upcountry markets, apart from the comparatively small number of *kothas* and *khattis*, in the more important centres, there are few places exclusively reserved for grain storage. Any kind of covered accommodation is liable to be put to this service as occasion arises. The rooms of houses are commonly used when required, as are also verandahs, courtyards or any other place affording protection from the elements.

Amritsar (Punjab) is probably the most important upcountry market from the point of view of storage. The local storage capacity is about 75|80 thousand tons but it is unusual for the total amount of accommodation available to be taxed to the full during the immediate post-harvest period. The maximum stocks are not more than 60|65 thousand tons. During the month of September and October 1936 local stocks were not far below 50,000 tons. It is significant that grain storage in this city is not centred in any special locality. In spite of great congestion within the city walls it was found that large quantities of wheat are stored on the ground floors and occasionally even in the upper floors of dwelling houses often situated at some distance from the market and in narrow *cul-de-sacs* inaccessible to vehicular traffic. This entails a considerable amount of man-handling in the transfer of the bags and their contents to the place of storage. (See plate facing page 202). Somewhat similar conditions obtain in varying degrees at Delhi, Cawnpore and other large congested urban centres.

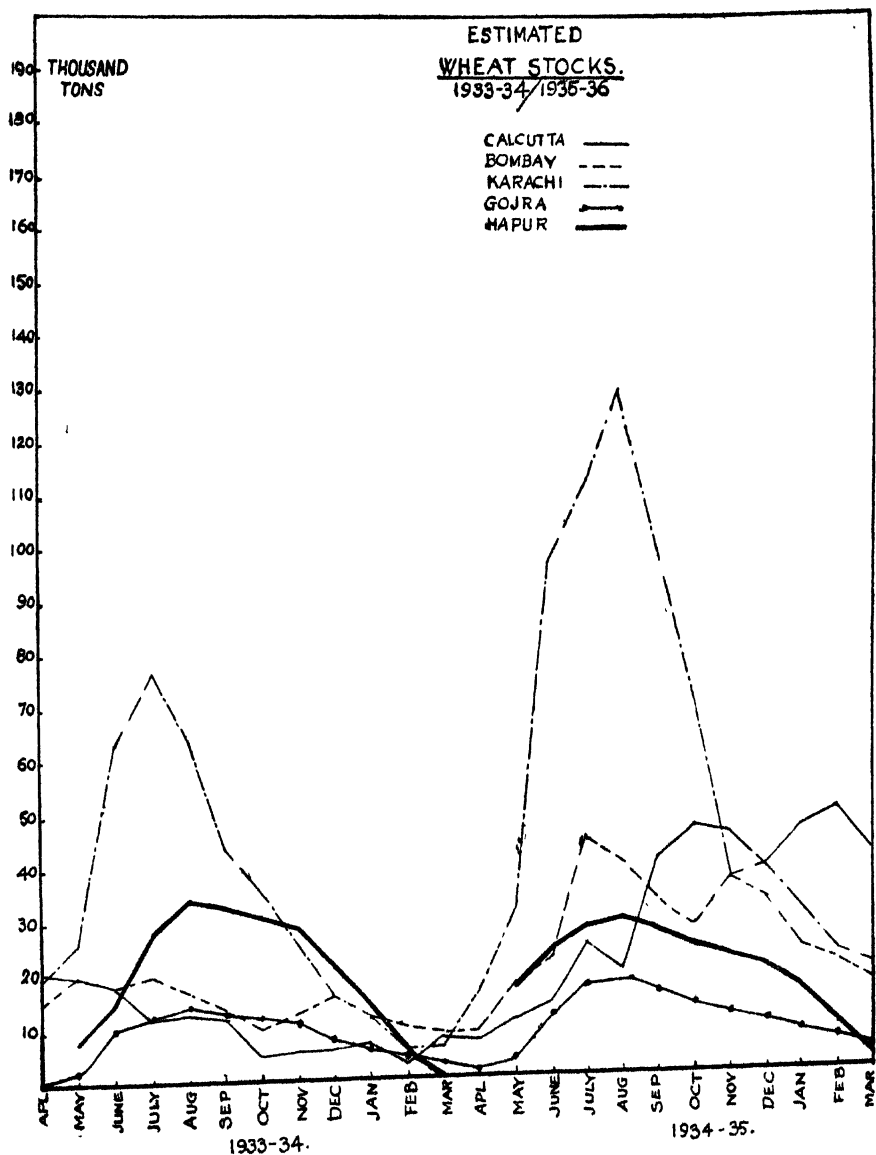
The total storage capacity and the amount of stocks held at different times of the year is therefore extremely difficult to estimate. It would appear from enquiries made during this survey that it would be reasonable to assume that the potential capacity far exceeds the demand normally made upon it. At Hapur (United Provinces), for instance, there are, apart from *kothas* or godowns, about 2,500 *khattis* with an approximate capacity of 70 to 75 thousand tons. During the past three years the actual stocks of wheat in *khattis* do not seem to have exceeded one-third of the maximum storage

capacity at any time of the year. Similar conditions were also observed at Deoband, another important market in the same area. There are at this place some 1,500 *khattis* with a total storage capacity of possibly 18 to 20 thousand tons but the maximum stocks held in this market in recent years occurred in 1933-34 when the total amount is estimated to have been about 8,000 tons. In 1935-36 the maximum stocks were about 1,000 tons lower. At Shamli, also in the same neighbourhood, the number of pits usually filled at the end of the harvest period is about 1,500 representing about 14 to 15 thousand tons but a number of *khattis* lie empty each season. At Hathras, 250 pits, equivalent to about 5,000 tons are the maximum normally filled in any one year. In Chandausi both pit and *kotha* storage are practised. About a hundred pits are usually filled, representing an average of rather less than 4,000 tons. To this figure an equal amount of wheat normally kept in *kothas* must be added. The total stocks at Chandausi are therefore about 8,000 tons. In the Punjab, the storage capacity also varies considerably. It has already been mentioned that Amritsar is the most important market in this respect. Lyallpur, Sargodha, Gojra, Jaranwala, all canal colony markets, have storing accommodation for 30 to 40 thousand tons each. The actual stocks held are, however, estimated to range from 50 per cent of capacity at Sargodha to about 75 per cent at the other markets in question. At Dhuri, a large market in Patiala State the local storage capacity is between 9,000 and 10,000 tons. In 1935-36 the highest stocks occurred in August and September and were about 3,000 tons or roughly one-third of the total available capacity.

On the other hand there are markets such as Meerut (United Provinces) where storage accommodation is insufficient. Out of the approximate harvest season's arrival of 11 or 12 thousand tons about two-thirds are diverted to Hapur for this reason. As a result later in the season Meerut has to re-import wheat for local requirements.

At the Ports, the potential storage capacity for all types of commodities is very large. Karachi is the main wheat port of India and, if all the facilities provided by the Port Commissioners were availed of to the exclusion of any other commodity, it is possible that about 450,000 tons of wheat could be accommodated apart from godowns in the city. The total open air stacking area amounts to 603,594 square yards with capacity for some 300,000 tons of wheat. Covered accommodation aggregates 180,418 square yards affording shelter and space for about 150,000 tons. Including godowns in the city well over 500,000 tons of wheat could be comfortably held in Karachi. In point of fact the approximate stocks of wheat, as will be seen from Appendix XLIII, have been very variable ranging from a few thousand tons to nearly 129 thousand tons in August 1934. The Bombay and Calcutta Port authorities, as at Karachi, do not allot any special godowns or areas for wheat storage. The total floor area at these two Ports is exceedingly large and if necessary could accommodate several years' wheat requirements of these cities.

The total amount of stocks estimated to have been held at the three main Ports of Karachi, Bombay and Calcutta, during 1933-34 and 1934-35 are also given in Appendix XLIII. It will be seen



that the maximum stocks ever held in any one month were about 190 thousand tons.

G.—Mill stocks.

Stocks of wheat maintained by the mills vary with the policy of their owners or managing agents. The stocks of wheat held by a mill on the last day of each month for a period of one year are given below and may perhaps be regarded as typical of upcountry mills situated in or near large producing areas. No hard or fast rule appears however to be followed as the play of economic factors such as price and demand for the product must necessarily influence stocks of raw material. These factors may vary from year to year so that while it might be expedient to carry large supplies during a certain period in one year, it would be most undesirable to adopt the same policy in another.

End of month stocks of wheat at a mill.

1934—				1935—			
			Maunds.				Maunds.
June ..	..	..	7,419	January ..	..	..	4,821
July ..	..	..	8,600	February ..	..	..	2,757
August ..	..	..	5,871	March ..	..	..	5,100
September ..	..	..	6,211	April ..	..	..	637
October ..	..	..	14,710	May ..	..	..	9,197
November ..	..	..	8,061				
December ..	..	..	4,690				

It will be seen that the heaviest stocks of wheat held by this mill occur in October, which month also shows the greatest milling activity. Thereafter stocks generally diminish and the smallest balances fall during the period December to April. The lowest point is reached in April with only 637 maunds or 23½ tons. As the end of the latter month coincides with the height of the harvest period in the neighbouring areas it would appear that every effort is made to work off the old stocks of wheat prior to the arrival of the new crop in May.

H.—Seasonal variation in stocks.

The periodicity of stocks is illustrated graphically in the diagram on page 224. The periodicity is very marked at Karachi and the two upcountry markets which have been taken as typical examples. Stocks are at their highest between June and August and thereafter tend steadily to decrease reaching low points just prior to the new season's harvest. At the large consuming ports such as Calcutta and Bombay, stocks are liable to greater fluctuation. Nevertheless these are usually higher between May and August than at any other time of the year. During 1934-35, however, serious competition between two shipping companies operating in the coastal trade resulted in the undercutting of freight rates. Accordingly shipments by sea to Calcutta and Bombay were exceptionally large during the latter part of the monsoon and in the autumn. Stocks at these two ports tended to rise rather later than the normal period. At Bombay, for example, stocks rose sharply between October and November 1934, while at Calcutta the rise started in August, reached the peak in October, fell slightly in December and rose again to a new high point in February 1935.

INTER-CHAPTER SEVEN.

Many and various are the methods of storage practised throughout India, from small woven *pallis* or *thekkas* in the villages holding only a few maunds each to the large godowns at the ports capable of storing hundreds of tons. In most of the upcountry markets storage is done in a *kotha* (generally a room in the *arhatiyas'* shop or a portion of a dwelling house adapted for the purpose) or a *khatti* (or *khondi*)—a pit in the ground lined with mud and *bhusa* (*kachcha*) or masonry, or concrete (*pakka*)—capable of holding from 250 to 1,000 maunds but usually about 450 or 500 maunds each.

The new system of concrete *khattis* erected by the local grain trade association at Muzaffarnagar is worthy of serious attention. Storage of this type, if specially provided with some form of roofing to make handling possible during the monsoon months and if constructed in close proximity both to the railway and to the market, would form a suitable model for the reorganisation of storage accommodation in all the main assembling markets. Not only is the Muzaffarnagar concrete storage a paying investment for the trade association, but it safeguards the grain in large measure against damage during storage so that it sells at a premium over wheat stored in *kachcha khattis*. On that account although the prime cost and seasonal charge are higher for concrete pit storage it is in the end cheaper and more economical than storage in *kachcha* pits. It may be observed incidentally that judging from the experience with the elevator at Lyallpur this form of storage is not suited to Indian conditions.

Owing to defective storage large losses are incurred each year by dampness and weevils as well as other vermin such as rats and white ants. The total loss is, on the most conservative estimate, about 3 lakh tons a year valued at over Rs. 2.4 crores. Any money devoted to the

elimination or control of this enormous loss would be money well spent.

At present the risks of storage are high not only owing to the amount of damage in storage but also on account of price risks. Storage costs are also, therefore, high and tend to produce a serious depression in prices at harvest time.

It seems clear that the risks can be largely eliminated or reduced by improved storage and by improved organisation for "hedging" stored grain on the "futures" markets. If this were done the present net margin of nearly 8 per cent gain could apparently be almost doubled. Assuming, however, that the traders' margin, by force of competition, remains at its present level the large drop in growers' prices at harvest time—amounting to almost 20 per cent at some centres—should on that account be reduced by something like 8 per cent.

In view of the substantial gains to be achieved for all concerned—growers, merchants and consumers alike—every inducement and encouragement should be given to trade associations or others operating in the large upcountry assembling markets to concentrate and improve the storage accommodation on the lines indicated and to make available a reliable system of "hedging" wheat stocks on the basis of standard "futures" contracts capable of being dealt in not only by local traders but also by buyers in the more distant consuming markets. This point is, however, more fully dealt with in a previous chapter dealing with standardisation.

Incidentally the gain in weight of wheat stored in exposed conditions—due to the absorption of moisture—is likely to blind some people to the need for improved storage and in some cases even give rise to opposition. Under a standard contract such wheat will no doubt in

due course be discounted or a premium given for dry wheat. Investigations are proceeding at the instance of the Imperial Council of Agricultural Research for determining the natural moisture content of wheat under different conditions in various districts with a view to establishing a basis for a fair rate of deduction.

The total available storage accommodation of all kinds in India is difficult to estimate and there is no regular record of the amount of stocks held, or of the amount of carry over in March from one year to the next. Figures obtained in the course of this survey from various centres show, as might be expected, that stocks are normally at their highest in June, July and August, by far the greatest concentration taking place in the upcountry markets. There is no evidence, however, that the carry over at the end of the year in any district usually exceeds more than about two months' supply. It should, perhaps, be observed that the trends of stocks at the various ports do not always correspond with one another or with stocks in the upcountry markets.

Having regard to the bearing of stocks on day to day prices it is essential that a proper system should be devised for regularly collecting, recording and publishing the stocks held at a number of the chief port and upcountry markets. A beginning in this direction has already been made by broadcasting weekly, along with prices, the stocks reported by a number of the leading trade associations.

CHAPTER VIII—HANDLING AND TRANSPORTATION.

A.—Handling.

(1) ON THE FARM.

The methods of dealing with produce on the farm are simple. Where the cultivator is obliged to dispose of portion of his crop directly from the threshing floor, the produce is generally weighed over by the buyer who may be either the village *baniya* or tradesman or one of the numerous itinerant dealers. Only occasionally is this done by the cultivator himself. Sometimes the village weighman is employed to weigh over the goods to the buyer in which case he often fulfils the rôle of broker, his services being paid by the seller either in cash or kind.

In Northern India and particularly in the Punjab until the end of the last century wheat and other grain used to be handled entirely in bulk until it reached the market. Sheets of strongly woven fabric made from hemp, wool or cotton were used in the transportation of grain from the threshing floor to the village. The carts were lined with similar material (*see* plates facing page 210). This method of handling grain in bulk between threshing floor and assembling market still continues in many parts of the Punjab and in the west of the United Provinces as well as in most areas in Central and Southern India and may, therefore, be regarded as applying to the greater part of the marketable crop. Bags are only rarely used on the farm by the grower owing to their relatively high cost and the wheat is bagged straight off the threshing floor only when it is bought by a merchant in some nearby market. This often happens in Sind where the large wholesale commission houses at Karachi send their own staff and bags to take delivery from the producer.

That portion of the crop which is retained by the cultivator for domestic use or for storing is carried to his home in headloads, by cart or on pack animals depending upon the quantity involved and the distance to be covered. In such cases the cultivator himself almost invariably utilises his own equipment for the purpose. Although wheat generally arrives in the assembling markets in bulk the use of bags is common in some of the large Colony markets of the Punjab. The extent to which bags are employed in different districts, however, varies. In Lyallpur and Montgomery, three-fourths of the arrivals from the farms and villages are transported in bags.

(2) CONTAINERS.

From this stage all the subsequent movement of wheat takes place in bags. These are made of jute and are known everywhere in India as "gunnies" or "gunny bags", or by the vernacular term "*khesi*". They are manufactured almost wholly in Calcutta and the immediate neighbourhood, although one or two jute mills have comparatively recently commenced operations elsewhere, notably at Cawnpore. The two commonest types of bags are the B-twill, which, as its name signifies, is made from a twill sacking, and the heavy C made from thick hessian cloth. The

former is largely used by the flour mill industry and the same gunny is the only type of container in which the wheat destined for export markets is packed*. The dimensions of this bag are 44" by 26½" and its weight 2½ lb. The heavy C is slightly cheaper and measures 40" by 28" weighing 2 lb. It is a popular bag in the internal trade. In India wheat is commonly packed either 2½ maunds (205 lb.) per bag net or 224 lb. net. The former packing is largely used in the internal trade while the latter is the standard weight for export and for most mills' purchases. The majority of grain trade associations specify 2½ maunds as the standard unit of weight per bag but the exchange at Lyallpur specifies 224 lb. net which is the export standard packing. For the purpose of invoicing, the tare of the B-twill and heavy C bags is generally recognised at 1 seer or 1 seer 2 *chhatanks* depending on the local custom. At Lyallpur the tare is however reckoned at 3 lb. while at a number of other markets in the Punjab the tare is calculated at 1 seer 2 *chhatanks*.

In Sind and Bihar wheat is frequently brought in bags to the market and in parts of Central India and Bombay the normal practice is for the buyer to use his own containers and return the seller's gunnies. As a general rule the cost of the gunny is met by the buyer. The quotations therefore at practically all the assembling markets in India are on the basis of wheat only, excluding the container. At the ports and at all large consuming centres up-country the produce is sold in the wholesale trade at a price which is inclusive of the bag. It is clear that, in the absence of any specification, the casual reader of the quotations appearing in the trade press is unaware that the price differences which exist between certain markets and in particular between large assembling markets and the terminals, are partly accountable by the price of the bag.

The original buyer only partially recoups himself for the cost of the gunny by debiting his buyer with the value of 2 maunds 21 seers of wheat of which 1 seer is recognised as the tare of the bag. He, therefore, receives the value of 1 seer of wheat for the bag, but in fixing the price the loss on the bag has probably been already taken into account. When the second buyer passes the wheat on to the last buyer or ultimate consumer the price quoted is the price for the wheat plus the bag.

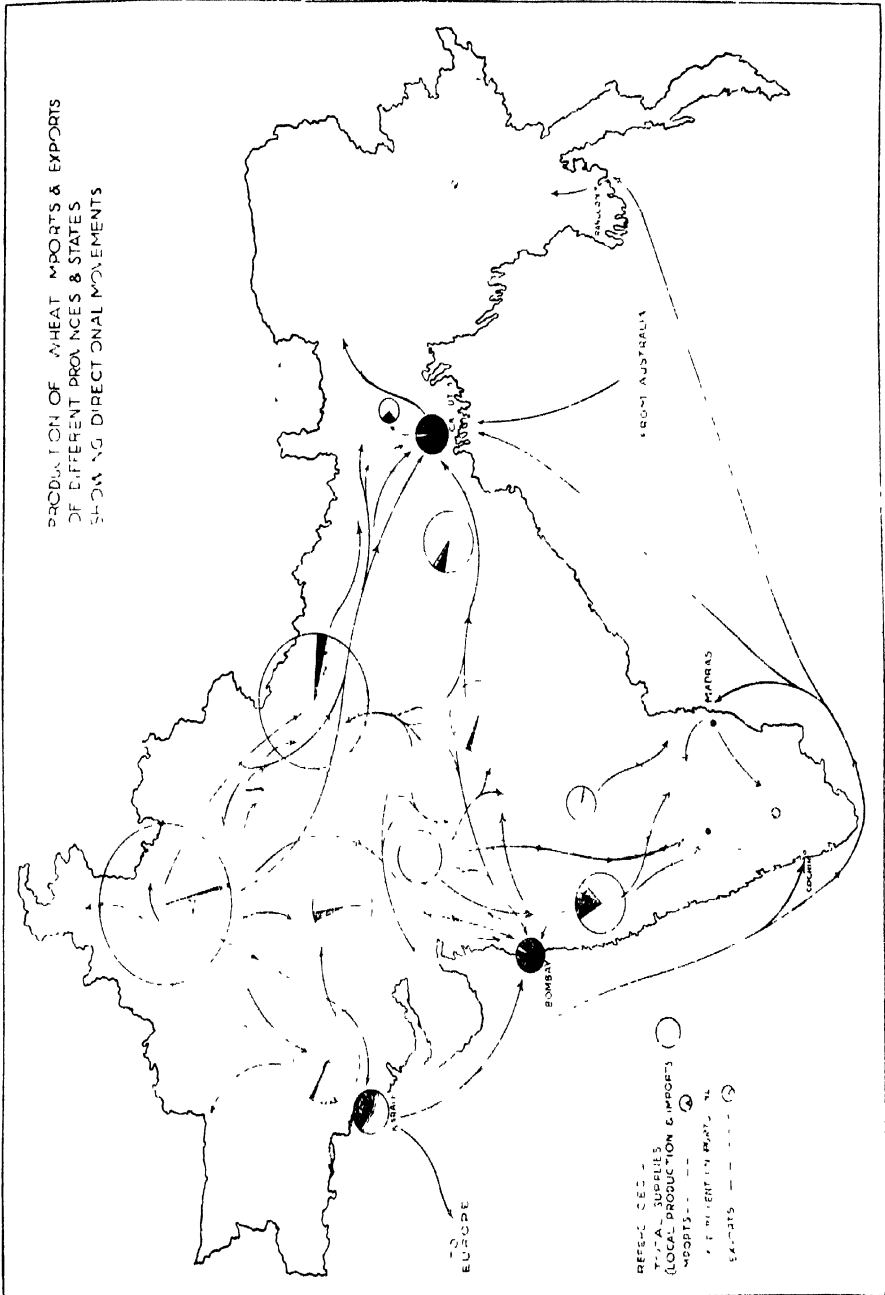
The current price of the B-twill bag f. o. r. jute mills in the neighbourhood of Calcutta is about Rs. 21 per 100. To this must be added transportation charges to Northern India (Punjab markets) which, on an average, amount to about Rs. 6 per 100, making the total cost of the bags delivered in the interior, Rs. 27 per hundred. The gunnies are normally packed in bales of 300 each but one or two jute mills have adopted a 400 packing per bale.

(3) IN MARKETS AND RAIL HEADS.

The handling of produce in the markets and various items of expense in connection therewith have already been discussed in

*It should be noted that shipments against the London Corn Trade Association contracts in the United Kingdom are permissible in heavy C bags, but with an allowance of ½d. per bag.

PRODUCTION OF WHEAT IMPORTS & EXPORTS
OF DIFFERENT PROVINCES & STATES
SHOWING DIRECTIONAL MOVEMENTS





LOADING FLOUR AT A RAILWAY STATION.

Note the use of hooks.



A CULTIVATOR WITH HIS PACK BULLOCK USED FOR TRANSPORTING WHEAT TO THE MARKET IN THE PUNJAB.

Chapter V. A number of operations are usually performed before the wheat is bagged and eventually finds its way to the railway station or buyer's godown, chief among them being cleaning or dressing, weighing, filling and stitching of the bags, transportation to the godown or railway station and stacking. Wheat imported from other provinces and distant markets or from abroad is invariably handled in bags of one or other of the two types already described. On arrival at the railway station the unloading of the wagons is undertaken by the railway staff, such labour being employed by a contractor who is paid per unit of 1,000 maunds. The handling and loading of the bags when goods are being exported to other markets is also one of the functions of the railway contractors' labourers and the cost is included in the rate of railway freight. The charges paid by the railways to their contractors may vary, even on the same railway. Typical examples are given in the following table.

Handling charges paid to railway contractors.

Stations.						Per 1,000 maunds.
						Rs. a. p.
Hapur. (East Indian Railway)	..	..	..	..	..	1 7 0
Kotdwar. Do.	..	..	..	..	..	2 4 0
Moradabad. Do	..	..	..	..	..	2 12 0
Dehra Dun. Do.	..	..	..	..	..	3 0 0
Delhi. (North Western Railway)	..	..	..	..	..	2 8 0

Although forbidden by the railway authorities, the use of hooks by railway coolies is quite usual at many stations (*see* plate on opposite page). The amount of damage done to the bags in this way may, on occasions, be quite serious particularly when bags are old and worn. Hooks are also frequently used by the cartmen or by market *palledars* or labourers in the Punjab and at the ports. Handling at the station is usually arranged for through a station broker (*hundikari*), whose charges vary from $\frac{1}{2}$ to 1 pie per maund in different markets according to the nature and size of consignments.

(4) AT RIVER GHATS.

For transport by water, wheat is carried in bags and where country boats are employed the cost of loading and discharging is generally not included in the boat hire charges and has to be paid for separately. Loading is effected by labourers paid for by the sender and unloading is at the expense of the receiver. In Sind, however, loading and discharge are services performed by the boatmen, the boat hire being inclusive of these charges. The average charge for loading and discharge seems to range between 3 and 6 pies per bag ($2\frac{1}{2}$ maunds) depending upon the distance of the boat from the stack on the river bank.

wheat were imported by sea into India and accounted for the drop in rail movement to this port. Sind and British Baluchistan shows a large decrease in imports from 71,500 tons to only 5,000 tons during the intervening years mainly as the result of the recent increase in cultivation of wheat brought about by the Sukkur Barrage. Decreases are also shown by Bombay from 126,700 tons in 1919-20 to 77,000 tons*, and by Rajputana from 50,100 tons to 21,700.

The average recorded inter-provincial trade in wheat by rail and river for the three-year period 1933-34 to 1935-36 is given in Appendix XLV. The total amount of wheat moved between provinces and trade blocks by rail and river amounted to 723,800, 784,900 and 815,300 tons in 1933-34, 1934-35 and 1935-36 respectively, the average for the triennium being 774,700 tons. If this figure be deducted from the total estimated quantity of wheat moved over the railways (*see* pages 243 and 244) the extent of the normal movement within the provinces themselves will be seen to be somewhere in the neighbourhood of 1,000,000 tons.

The main directional movement of wheat based on the average of 1933-34 to 1935-36 takes place from the Punjab, the largest surplus area in India, to Karachi, Calcutta, the United Provinces and Bombay Port in that order of importance. About 107,000 tons on an average moved to Karachi, 58,000 tons to Calcutta, 44,000 tons to the United Provinces and 33,000 tons to Bombay Port. Other large movements are those between Sind and Karachi, *i.e.*, 154,000 tons, Central India and Bombay Presidency, 47,000 tons, the Central Provinces and the Bombay Port, 26,000 tons, the Punjab and Rajputana 23,000 tons and from the Central Provinces to the United Provinces to the extent of about 18,000 tons. These directional movements are illustrated on the map facing page 230 which also shows the production, exports and imports of the major producing and consuming provinces, States and cities drawn to scale.

(2) BY ROAD.

(a) *Carts and pack animals*.—The roads which connect the farm or village with the nearest assembling market are, as a rule, unmetalled (*kachcha*). In many parts of the country as, for instance, in Sind these unmetalled tracks lie below the level of the field and are therefore subject to complete inundation during the monsoon. The chief means of conveyance over these roads or tracks are bullock carts and pack animals such as donkeys, mules, bullocks, camels and buffaloes. By far the commonest means of transportation, in Northern India generally, is the two-wheeled bullock cart drawn by a couple of bullocks (*see* plate facing page 210). The carrying capacity of the average bullock cart plying on unmetalled roads varies from 12 to 20 maunds. In the Central Provinces and in Bombay 6 bags weighing 15 maunds is the average load for a country cart. In the Punjab and the north, however, as much as 40 maunds may sometimes be carried in a single cart. This is possible because of

*Sea imports into Bombay *via* Karachi have slightly increased during the past three years.

the stronger type of draught animal bred in those parts. In the Delhi district and the surrounding areas of the Punjab and the United Provinces four-wheeled camel carts are by no means uncommon but these are usually employed on metalled (*pakka*) roads.

Donkeys are a common means of transport in parts of Northern India such as Sialkot, Gujranwala, Gurdaspur and Amritsar districts in the Punjab. They are used chiefly in the monsoon partly because the bullocks are needed for agricultural work and also because of the bad condition of the unmetalled roads and the cessation of vehicular traffic. The average donkey load ranges from $1\frac{1}{2}$ to 2 maunds. Mules are occasionally used in the foothills of the Himalayas and carry twice as much as a donkey.

Camels are ideally suited to unmetalled roads and are therefore very popular in Sind—where they carry 60 per cent of the traffic—, Rajputana, in the western districts of the Punjab such as Jhang, Mianwali, Dehra Ghazi Khan, etc., and in Hissar in the east of that province. In these latter areas the *kachcha* roads are poor owing to the soil being light and friable and the conditions for using camels are therefore favourable as canal irrigation has not yet spread in the neighbourhood and grazing lands are plentiful. The camel whose stamina is proverbial also appears to be gaining in popularity as a beast of burden with the introduction of Persian wells in other districts of the Punjab, e.g., Jullundur, Ferozepore and Ludhiana. The carrying capacity of the average camel varies from 7 to 10 maunds and the type of container in which the grain is transported by this agency and by donkey is a kind of saddle bag of goat's hair with two pockets. Equal amounts of grain are put in each pocket and the bag is slung across the animal's back. These containers belong to the owners of the animal and are used time after time. Their normal life is about 2 years.

Bullocks and buffaloes are not employed on a large scale and are used only during the rainy season when the *kachcha* roads are impassable to vehicular traffic. Bullocks usually carry loads of anything from 2 to 4 maunds depending upon the size and strength of the animal. In the Punjab these pack bullocks are small and very hardy (see plate facing page 231), and are kept by *telis* or oil crushers who buy produce on their own account and transport it to the market for sale. Ponies are used in the Central Provinces and elsewhere for the same purpose.

The roads which connect the market with the railway station are almost invariably metalled. Some are even tarred in the larger centres. The number of first-class trunk roads in India is relatively limited, the two main systems being the Grand Trunk Road between Calcutta and Peshawar and the Trunk Road which links Northern India to Bombay and the South and passes through Delhi and Central India. The Grand Trunk Road of Northern India is one of the main arteries of road traffic between important consuming centres such as Benares, Allahabad, Cawnpore, Agra, Delhi, Amritsar, Lahore, etc., and it is joined at intervals by subsidiary roads leading off from important producing areas. In recent years, however, the mileage of metalled roads has been gradually increasing and

*Relative performances of solid and pneumatic tyred wheels.**Pusa.*

	Gross Earning.	Expenditure.	Net Earning per trip.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Pneumatic tyred cart	3 2 0	0 12 0	2 6 0
Farm Cart (solid wheels)	1 12 9	0 12 0	1 0 9
Hired Cart (solid wheels)	1 10 3	0 12 0	0 14 3

Bombay.

	Trips per day.	Load carried monthly (Tons).	Monthly mainte- nance cost.	Cost per ton.
			Rs. a. p.	Rs. a. p.
Country Cart (solid wheels) ..	3	34	103 6 6	3 0 8
Cart (pneumatic tyred)	3	124	102 1 8	0 13 2

It will be seen that besides a considerable reduction in the cost of transport by the use of pneumatic tyres, the handling capacity is also improved. It is also stated that with pneumatic equipment there is not only a gain in speed of 20 to 25 per cent but less damage is done to the roads. On the basis of tests made by the Central Public Works Department, the damage done to roads by a fully laden iron tyred cart doing four miles a day amounts to Rs. 228 a year.

(3) BY RAIL.

(a) *Classification of goods.*—The earlier goods classifications on Indian railways fell into five groups, *e.g.*, minerals forming the first, agricultural produce the second group, gold and specie being reckoned in the fifth. By 1873 classifications had expanded on the company-owned lines although the State railways quoted lump sum station to station rates irrespective of distance. In 1905 a Traffic Committee of

the Indian Railway Conference Association was responsible for the introduction of a uniform system of freight tariffs. In 1910 the first general classification of goods came into force. During the war (1st April 1917) a surcharge of freight rates was levied as a purely temporary war measure but this was replaced by a primage charge of Re. 0-2-6 per rupee of freight, under the Indian Finance Act, 1921. The State railways did not receive any benefit from these increased earnings and endeavoured to have the surcharge substituted by an increase in rates. A new classification was the result and this came into force from 1st April 1922 continuing until the end of April 1936. Under this classification there were 10 classes and the charges brought about raised the maximum charge permissible on almost every commodity by 15 to 25 per cent. At a conference in July 1935 between the Indian Railway Conference Association and representatives of commercial bodies, it was suggested to increase the existing number of classes from 10 to 16 while leaving the basis of minimum rating to continue unaltered. The 16 classes and the basis of classifying now in force as from 1st May 1936, are as follows :—

Class.							Maximum per maund per mile. (pies.)	Minimum per maund per mile. (pies.)
138	} .100
2	..	..	..	..	..	..	.42
2A	..	..	..	..	..	..	.46
2B	..	..	..	..	..	..	.50
2C	..	..	..	..	..	..	.54
358	} .166
4	..	..	..	..	..	..	.62
4A	..	..	..	..	..	..	.67
4B	..	..	..	..	..	..	.72
5	..	..	..	..	..	..	.77
683	} .166
6A	..	..	..	..	..	..	.89
7	..	..	..	..	..	..	.96
8	..	..	..	..	..	..	1.04
9	..	..	..	..	..	..	1.25
10	..	..	..	..	..	..	1.87

(b) *Basis for fixing rates.*—Wheat is placed in the first class and wheat flour in the second. The rates are in turn modified by schedules and each railway is at liberty to have its own schedule. The grouping of commodities into classes is for the purpose of arriving at the rate to be charged when no station to station or schedule rate is quoted and for fixing the maximum and minimum rate per maund per mile within the limits of which all rates, of whatever kind, must be kept, subject to exceptions specially authorised by the Railway Board. Schedule rates are rates quoted on a basis lower than the maximum of the class. It may be on a uniform basis or it may vary according to distances on the telescopic (cumulative) principle. A schedule rate may be quoted either in maund units, per ton or per wagon. A typical telescopic schedule rate varying according to distance is as follows :—

	Pie per md. per mile.
For the first and up to 300 miles .. ..	.380
For distances above 300 miles but not exceeding 700 miles to be added to the charge for 300 miles .. ..	.130
For extra distances above 700 miles to be added to the charge for 700 miles .. ..	.100

Schedule rates are distinguishable by letters. Station to station rates are special rates for the total distance between two specific points. They may be quoted as between two stations on the same railway, as between a station on one railway and a station on another railway and between a junction and a station, or between two junctions. The point worth noticing is that when goods are carried over more than one railway the rates are not calculated on the through distance between stations of origin and destination but separately for the different railway lines. The traffic thus receives the benefit of the telescopic scale of rates only on the local distance to the junction instead of the whole distance which traffic has to move.

Further additions are made to the rates quoted by the inclusion of terminal charges both for local bookings (*i.e.*, from one station to the other on the same railway) and for through bookings (*i.e.*, from a station on one railway to a station on the other railway). Bookings of a lesser distance than 75 miles have to pay a short distance charge of 3 pies per maund. The minimum weight for charge is 20 seers.

Special station to station rates are quoted on the basis of the principle "what the traffic can bear" in cases where the normal rate cannot be applied owing to competition. In actual practice the North Western Railway has applied special station to station rates to a large number of stations in the Punjab in recent years.

Specimen rates of freight between the following important producing and consuming centres at present are :—

—	Mileage.	Class rate.	Schedule rate.	Special rate.
		Rs. a. p.	Rs. a. p.	Rs. a. p.
1. Lyallpur and Karachi ..	685	1 6 4	0 11 10	0 11 10
2. Lyallpur and Howrah—				
(Lyallpur to Saharanpur) ..	328	0 10 9	0 8 0	0 8 0
(Saharanpur to Howrah) ..	938	1 10 2	0 11 9	0 8 4
		2 4 11	1 3 9	1 0 4
3. Lyallpur to Bombay—				
(Lyallpur to <i>via</i> Bhatinda)..	204	0 6 10	0 6 0	0 6 0
(<i>via</i> Bhatinda to Bombay)..	983	1 9 4	1 0 11	0 14 0
	1187	2 0 2	1 6 11	1 4 0
4. Gojra to Cawnpore—				
(Gojra to Saharanpur) ..	431	0 14 0	0 9 0	..
(Saharanpur to Cawnpore)	258	0 8 6	0 5 9	..
		1 6 6	0 14 9	..
5. Okara to Delhi	328	0 11 1	0 8 4	..

(c) *Terms of booking, delivery, etc.*—Wheat is usually booked at railway risk, but defective consignments (*e.g.*, where bags are old, etc.), are only accepted by the railway at owner's risk. Enquiries made at a large number of stations showed that the condition of the bags used for packing wheat is generally satisfactory and that more than 90 per cent. of the consignments are accepted at railway risk.

Wheat is almost always carried in covered wagons which can be locked. The capacity of wagons varies considerably. The four-wheeled types operating on the broad gauge lines carry anything between 14 and 24 tons. The number of wagons of 14, 15 and 16 ton capacity is, however, limited. The four-wheeled wagons of the narrow gauge type carry from 9 to 11 tons. Eight-wheeled bogies are also used to a limited extent and handle double the quantity carried by the four-wheeled type.

So far as outward traffic is concerned the railway staff are expected to weigh at least 10 per cent. of every consignment of wheat. Enquiries made, however, show that the usual practice is to weigh two or three bags only out of the whole consignment. It is only

when these test bags are found to be under or over-weight that an additional number of bags is selected for checking. The station records always show that the full 10 per cent of the consignments were checked. As regards inward traffic the same rules are observable but are seldom carried out in practice. When checked the consignments are tested on platform scales of European pattern.

As regards accommodation there were a number of complaints both from the Punjab and from the United Provinces and Bihar. Covered accommodation appears to be insufficient in a number of cases and at a few stations, such as Arifwala and Moga on the North Western Railway in the Punjab, there are no covered sheds at all. It appears that something might be done to ameliorate conditions in this respect.

Wharfage and demurrage are charged on inward traffic. Their rates vary with each railway. On the North Western Railway, for example, wharfage is charged at the rate of 3 pies per maund per day or part of a day in excess of the free period which is usually 24 hours. For outward traffic the rate is the same as for inward traffic and is charged on consignments brought to the station but not booked by midnight of the day following that on which the goods are received at the station. The demurrage rate of full wagons on the North Western Railway is 1 anna per ton and is charged after 9 hours delay from the time at which the vehicles are placed in position for loading or unloading for outward or inward traffic respectively. These details are given in the General Rules of the Railway Goods Tariff.

(d) *Special Concessions.*—For some time past the Punjab Government have been in favour of a reduction in the railway freight rate on wheat particularly to Karachi and Calcutta. In 1931 the Railway Board offered to grant a rebate of one-third off the ordinary rate on condition that the local Government would bear the cost of this rebate if during the total period for which the rebate was in force wheat booked from the Punjab to Calcutta was less than 750 tons per week and bookings from all parts of India to Calcutta less than 2,250 tons per week. This condition was accepted by the local Government and the rebate was put into force from 1st February to 31st March, 1931. During this period 13,131 tons of wheat moved from the Punjab to Calcutta, an average of about 1,600 tons a week, and the general result was that some 8,312 extra tons of surplus wheat were taken out of the province without apparently adversely affecting other interests. This experiment proved that in certain circumstances and for a limited period reduced rates would attract traffic from a particular area.

From November 1930 to February 1931 the rate per maund from Lyallpur to Karachi was reduced to Re. 0-6-10. It was raised to Re. 0-11-8 and again lowered to Re. 0-8-5 from 15th May, 1931 to 19th June, 1931. It was lowered back to Re. 0-6-10 from the 20th June to 15th September, 1931. Exports were not stimulated during this period. From the 26th September, 1934, a rebate of 25 per cent has been granted on the rates of freight on wheat exported to Aden and foreign ports west of Aden. This concession is to last

up to the end of 1937. The rebate has, from December 1936, been allowed also on exports to Singapore and foreign ports further east. Until the middle of 1936 this concession had no effect at all on exports as the disparity between Indian and world prices was greater than could be bridged by the 25 per cent. rebate. Since July, however, Indian prices have once again moved into export parity and a substantial volume of export trade has and continues to take place, helped without doubt by the 25 per cent. rebate.

It is interesting to observe that the Road-Rail Traffic Act of 1934 conferred upon the railway companies of Great Britain the right to charge freight in accordance with "business ethics". The English Act allows railways to quote a flat rate for transport of all the products of any particular firm to a number of different stations and the principle of "agreed charges" has led in some cases to the transport arrangements of manufacturers and shippers being entrusted wholly to the railway companies who collect, transport, store, and deliver the goods as required.

(e) *Volume*.—The total volume of wheat handled by the major railway systems in India in the years 1933-34 to 1935-36 are shown in the following table :—

Wheat handled by railways.

Name of Railway	Wheat carried (in hundred tons).		
	1933-34.	1934-35.	1935-36.
North Western	904,2	1,046,7	1,027,8
Great Indian Peninsula	235,0	241,5	309,8
Bengal Nagpur	51,4	73,5	68,8
South Indian	13,7	14,1	16,7
Bengal and North Western	134,6	66,3	67,0
Bombay, Baroda and Central India	254,0	258,6	305,0
East Indian	339,9	321,5	363,2
Madras and Southern Mahratta	52,4	50,6	56,9
Eastern Bengal .. .. .	..	..	..
Total	1,985,2	2,072,8	2,215,2

This, however, does not represent the exact quantity which actually moves over the railways as obviously a proportion of certain railways' traffic passes over other systems on its way to its eventual destination and is, to this extent, doubly accounted for. For example,

an appreciable amount of wheat carried by the East Indian Railway is through traffic from the North Western Railway in the Punjab to the United Provinces, Bihar and Bengal (Calcutta). The quantity shown against the East Indian Railway must, therefore, be reduced accordingly. For this reason it is not possible to make a precise estimate of the exact quantities of wheat actually loaded and handled by each railway, but by adjusting the inter-provincial movements as published monthly in the "Rail and River-borne Trade of India" with the data shown in the above table a very fair approximation can be arrived at. Allowing, therefore, for the quantities of through traffic in wheat carried from one railway system to another, which is roughly between 300,000 and 350,000 tons, it may be reckoned that 1.7 or 1.8 million tons is put on rail during an average year. This represents about one-sixth of the total crop and about one-third of the total quantity of wheat marketed.

(4) BY RIVER.

The amount of river traffic in the Punjab and Upper Sind has been greatly reduced since the spread of canal irrigation. Rivers which were formerly navigable have been tapped at various places within the Punjab and are no longer suitable for the perennial transport of agricultural produce. The only rivers now largely used for transportation are the Chenab and Sindh from below Mianwali down to Sukkur. Navigation on the latter has been adversely affected by the construction of the Panjnad Canal Head-works and the produce has to be transhipped at this point.

The types of country craft which are so largely used today have not changed from time immemorial. When proceeding down stream they drift with the current and are aided by sail and sometimes by oars. For upstream journeys, however, the boats have often to be towed either by bullocks or by man-power.

The capacity of these country boats varies from 200 to 2,000 maunds. Boats of large capacity are used on long distance traffic only.

As already mentioned wheat is never transported in bulk by this means. In order to protect the grain from damage the bottom of the vessel is lined with planks or *bhusa* and the wheat is also protected from rain by means of gunny *pals** and in rare cases by pieces of tarpaulin. It was observed that a certain amount of wheat is often damaged by water percolating through the seams in the sides of the boat.

Costs.—The chief attraction of transport by water is its low cost. But water transport as compared with rail is usually slower. For example, under the most favourable conditions it takes four days for wheat to reach Sukkur from the Punjab—a distance of 150 miles—and further delays of more than a week at a time may often be caused owing to difficulties of navigation particularly in the monsoon season. Another disadvantage is that the boatmen

*A number of old empty gunny bags stitched together to form a large sheet.

frequently tamper with the produce during the course of transit and many cases have been known of the grain being replaced by sand and the bags carefully re-sewn to avoid suspicion.

The rates quoted by country craft are very low. For example, from Alipur to Sukkur, a distance of about 150 miles the rate of freight is Re. 0-2-3 per maund. The cost of transport by rail for a similar distance to the nearest railway station is Re. 0-4-10 a maund. In Bihar the country boats were found generally to charge about half the fare of the steamers belonging to the India General Steam Navigation Co., or the Bengal and North Western Railway Ferry Services. The freight rates of the Indian General Steam Navigation Co., from Patna to Goalando, Dacca and Bhairab were Re. 0-7-0, Re. 0-7-9 and Re. 0-9-9 per maund respectively in 1935-36, while the country boatmen charged from Re. 0-4-0 to a maximum of Re. 0-6-0 right down to Bhairab. In Sind, river transport on the Indus costs Re. 0-1-0 per maund for distances of 20 to 50 miles and Re. 0-2-0 for longer carries even up to 400 miles. During the inundation period when the river is full and there is a strong downstream current, a distance of 100 miles may be covered within about two days. With a slow current it takes about four days to cover the same distance. The freights in Sind were found to be the same in all seasons but for long distance journeys it is customary for the consignor to give one maund of wheat for every 100 maunds carried as food allowance to the boatmen. This is in addition to the freight charge. Frequently the consignor's own representative is sent along with the goods in order to watch over their safety. Half the freight is paid at the time of loading and the other half after the goods have been discharged at the receiver's destination.

In the Punjab a certain amount of traffic also takes place on the Sirhind canal. The head works of this canal are at Rupar and this is the starting and terminal point for all the boats plying on the canal. Free navigation is allowed within 2 miles of the head-works, but on every boat embarking on a journey beyond this limit a charge is levied by the canal authorities at the rate of Rs. 7-0-0 per month or Rs. 3-12-0 for half a month. Upstream journeys are made under tow by a pair of bullocks, the towage charges between two points 36 miles from each other, being Rs. 12-0-0 for fully loaded boats and Rs. 8-0-0 for empty craft. The transport charges for the same distance generally vary from five to eight annas per bag or 2½ maunds of wheat or 2 maunds of wheat flour, and where a load is guaranteed both on the outward and return journeys, the transport charges are reduced. A typical canal boat in good condition can carry between 600 and 750 maunds.

(5) BY SEA.

(a) *Coastal trade.*—A large quantity of wheat is annually transported by sea from Karachi to Bombay, Calcutta and to a lesser extent to other coastal ports. A certain amount of inter-coastal trade also takes place between Bombay and Malabar coast ports such as Ratnagiri, Mangalore, Cochin, etc. The total volume of trade from Karachi to Bengal, Bombay, Madras and Burma represents the greater proportion of the coastal wheat trade by

steam vessels and is shown in Appendix XLVI. In 1932-33 the shipments were 141,784 tons, in the following year 119,401 tons and in 1934-35, 205,199 tons, this greatly increased figure being brought about by rate cutting, one of the results of the "freight war" in 1934 between two shipping companies engaged in coastal trade. Coastal shipments of wheat from Bombay are partly re-exports of wheat brought to Bombay from Karachi and are not large, the annual average being about 5,000 tons, mostly to Madras. The volume of traffic by sea-going country vessels such as *dhows* has diminished to very small proportions and it is not possible to estimate how much wheat or wheat products are so transported. The risks and delays attending the transportation by sea of grain and other commodities by *dhows* and country vessels are great and an increasingly large number of small ports on the west coast of India are now being tapped by indigenous steam shipping companies, such as the Bombay Steam Navigation Co., employing steamships of limited size.

The steamship lines engaged in coastal trade in India normally operate under a Conference whereby rates are fixed, the object being to eliminate excessive competition. The rates of freight from, say, Karachi to Calcutta since 1931 have ranged from Rs. 7 per ton net to as low as Rs. 1-8-0 per ton between July and November during the "freight war" year of 1934. The average seems to be in the neighbourhood of Rs. 5 per ton, which was the freight ruling during a part of 1931, throughout 1933, from January to April 1934 and from November 1934 to July-August 1935. At present (December 1936) the quotation is Rs. 4-12-0 per ton less 10 per cent. rebate granted to shippers who have confined their shipments to the companies forming the Conference.

Periodicity.—The periodicity of movement by sea to coastal ports will be clear from Appendix XLVI and is very marked. Shipments are very high in July, August and September. October also shows considerable activity in certain years. Thereafter shipments fall off until they are at a minimum during the pre-harvest months of January to March.

(b) *Foreign Trade.*—This has been discussed in Chapter I. Wheat for export may be shipped by one of the regular steamer services of which there are at least four operating between Karachi, the United Kingdom and the Continent, or when large quantities are concerned vessels may be specially chartered in London by the exporter for this purpose. For obvious reasons freight by chartered vessels is almost invariably cheaper than freight by the regular services known as liner tonnage. Chartering vessels for full cargoes is effected on the Baltic Exchange in London, freight being payable in the United Kingdom usually in London after discharge. Liner space is booked through freight brokers at the ports in India and the freight is payable at the port of loading.

Freights are an important factor in the marketing of wheat abroad. A comparative statement is given below of the rates of freight between Karachi and the United Kingdom from 1927 to August 1936.

*Sea freights per ton of 18 cwts.**
(Sterling).

					Maximum.	Minimum.	Average.
1927					24 6	18 0	20 11
1928					22 3	15 0	10 6
1929					24 0	17 6	19 9½
1930					20 0	15 3	16 3½
1931					21 6	15 0	17 9½
1932					21 3	15 6	19 10½
1933					24 0	20 3	21 10
1934					24 0	20 3	21 8
1935					27 3	19 0	21 10½
1936†					29 3	20 6	25 2

NOTE.—Freight rates on bagged wheat cargo to the United Kingdom from Sydney, Australia, ranged from 20 (sh.) to 32½ (sh.) sterling during the period 1931-1934. If freight is prepaid in Australia, as is the customary for liner space in India except where specially chartered vessels are concerned, an additional charge is required to be paid since 1931-32 by shippers in respect of the exchange difference between Australian currency and sterling.

*Monthly averages on which the annual figures are based include forward quotations also.

† To August only.

INTER-CHAPTER EIGHT.

The cultivators almost always transport their wheat in bulk to the nearest market. In the assembling markets in the producing areas some wheat is stored in bulk and some put in sacks before storing but in any case from that point onwards all the wheat is handled in gunny bags (*khesi*). B-twills 44" \times 26½" are used for export and very largely for the mill trade in wheat and products and heavy C 40" \times 28" in the internal trade. At present these bags cost about Rs. 26 or Rs. 27 per 100 delivered in the Punjab markets.

In some markets, and particularly in the assembling markets of the producing areas, the price of wheat excludes the price of bags but in the ports and some of the large consuming centres in the interior the market price as quoted includes the cost of the bags. This is another of those factors which make it difficult to compare prices in one market with those of another.

It is frequently suggested that the costs of distribution could be reduced by eliminating the use of bags and handling all the wheat in bulk. This would involve the creation of suitable storage, transport and handling facilities at every stage. The experience of the Lyallpur elevator indicates that isolated attempts to introduce bulk handling cannot be successful. The question is, however, do the buyers wish to have their wheat delivered in bulk or sacks.

The export trade is now relatively so small and spasmodic that exporting merchants, port authorities and shipping companies have no inducement to make permanent alterations in their warehouse accommodation and equipment to provide for bulk handling.

Although existing railway wagons could apparently be readily adapted for the purpose, the large Indian

roller mills show no inclination to adopt the bulk system—partly probably because by the present methods of trading by a large number of mills the latter make a profit on the sale of bags to the purchasers of their flour and *ata*. The greater part of the wheat entering the channels of distribution goes to wholesale markets and subsequently to retailers, *chakkis*, millers and consumers. These markets are in the main very congested. Purchases are made in small quantities and for this general trade the handling of wheat in sacks is most convenient and appropriate. There seems no likelihood of any immediate change in the nature of those requirements so that the question of applying bulk handling methods to the greater part of the wheat trade in India may be left out of consideration for the time being.

Railways play an important part in the transport of wheat. In the course of the year more than 1.7 million tons or about one-sixth of the total crop is put on rail and railway freight forms a high proportion of the total cost of distribution. For example the average difference per maund for a 5-year period on Punjab wheat selling in Lyallpur and Calcutta is Rs. 1-1-7 of which Rs. 1-0-4 is due to rail freight alone although this is a special reduced rate.

There is also a good deal of coastal traffic—especially from Karachi—amounting to between 150,000 and 200,000 tons in the course of a year. River transport is not, apparently, very important but it is difficult to arrive at the precise amount carried especially by country boats.

Large quantities of wheat are also carried by bullock-carts and pack animals such as donkeys and camels. For distances up to 40 miles or so the bullock-cart appears to be preferred to rail transport. More recently the motor lorry has become of increasing importance wherever metalled (*pakka*) roads exist. In

spite of special rail freight concessions and even where the rate by lorry is higher than rail—*e.g.*, from Okara to Lahore (80 miles) the rate per maund by lorry is Re. 0-3-6 as against Re. 0-2-11 by rail—transport by lorry is preferred by senders. The reasons given are :—

- (1) direct collection from senders and delivery to buyers by lorry ;
- (2) saving of time owing to slowness of rail goods transport ;
- (3) elimination of trouble at the station and of the necessity to placate railway staff.

It is apparent therefore that the question is not altogether one of cost but of better service.

CHAPTER IX.—WHOLESALE DISTRIBUTION.

Assembling and distribution are two main phases in the operation of moving the crop from the producer to the consumer. The diagram on page 253 illustrates how the crop passes into consumption and shows the approximate extent of participation of the various agencies concerned. Practically all the agencies engaged in the assembling of wheat also function in its distribution. The movement of the crop up to the stage at which it reaches the hands of the wholesaler or first buyer at the assembling centre has already been discussed in Chapter V. In this chapter the subsequent movement of the wheat is followed through the different intermediaries to the consumer.

The unit of wholesale transactions varies according to the size and importance of the market and the volume of trade. It may be as low as 5 or 10 bags at a time or it may be hundreds of tons especially where mills' agents or exporters are concerned.

A.—Agencies and methods.

The wholesale distribution of wheat may be carried out through one or other of the following agencies: (1) Cultivators, village merchants and itinerant vendors, (2) *Kachcha arhatiyas*, (3) *Pakka arhatiyas*, stockists, mills' agents, etc., (4) Co-operative organisations and (5) Exporters.

(1) CULTIVATORS, VILLAGE MERCHANTS AND ITINERANT VENDORS.

The activities of these are mostly confined to the villages and the immediate neighbourhoods in which they live. As distributors they operate largely in *shandies* or periodical markets. In the United Provinces, for example, the cultivators are reported to supply about half the requirements of the non-cultivating well-to-do rural population. Growers who take their products to the periodical markets or *shandies* may sell small quantities direct either to petty merchants, retailers or consumers and are an important factor in distribution in Central India. On the whole, however, the more important agencies are the village merchant and the itinerant trader. A rough estimate would place the total quantity of wheat distributed by these three agencies at not more than 1 million tons about two-thirds of which are purchased by the retailers in the assembling market for subsequent disposal to local consumers.

(2) KACHCHA ARHATIYAS.

As already mentioned these traders work mainly as commission agents on behalf of the village sellers of agricultural produce. During the slack period towards the end of the season when there is often an appreciable movement of wheat back to the rural areas from the large assembling markets the *kachcha arhatiya* reverses his former rôle and becomes an agency for linking up the *pakka arhatiya* and stock-holder with the small merchants and retailers in the neighbouring villages.

(3) *Pakka arhatiyas*, STOCKISTS, MILLS' AGENTS, ETC.

These are the chief distributing agencies and their general functions have already been described on page 132. Unlike the *kachcha*

arhatiya who usually represents the primary producer or seller the *pakka arhatiya* acts on behalf of the buyer. The *pakka arhatiya's* client may either write, telegraph or telephone him to buy and despatch certain specific qualities and quantities of wheat or to buy and store on his account. Clients may also be present and give orders in person and supervise their fulfilment. The *pakka arhatiya* is concerned with the distribution of produce assembled through the *kachcha arhatiya*, and although the *pakka arhatiya* may buy for others, he does so on his own credit and assumes full responsibility for the produce so acquired. He usually has a regular clientèle and possesses a good knowledge of the requirements of the various markets for which he buys. As it is impracticable under present conditions for distant wholesalers and retailers to make large purchases without special knowledge of local practices in the market in which they buy, the *pakka arhatiya* appears to be an effective and necessary link between the various markets.

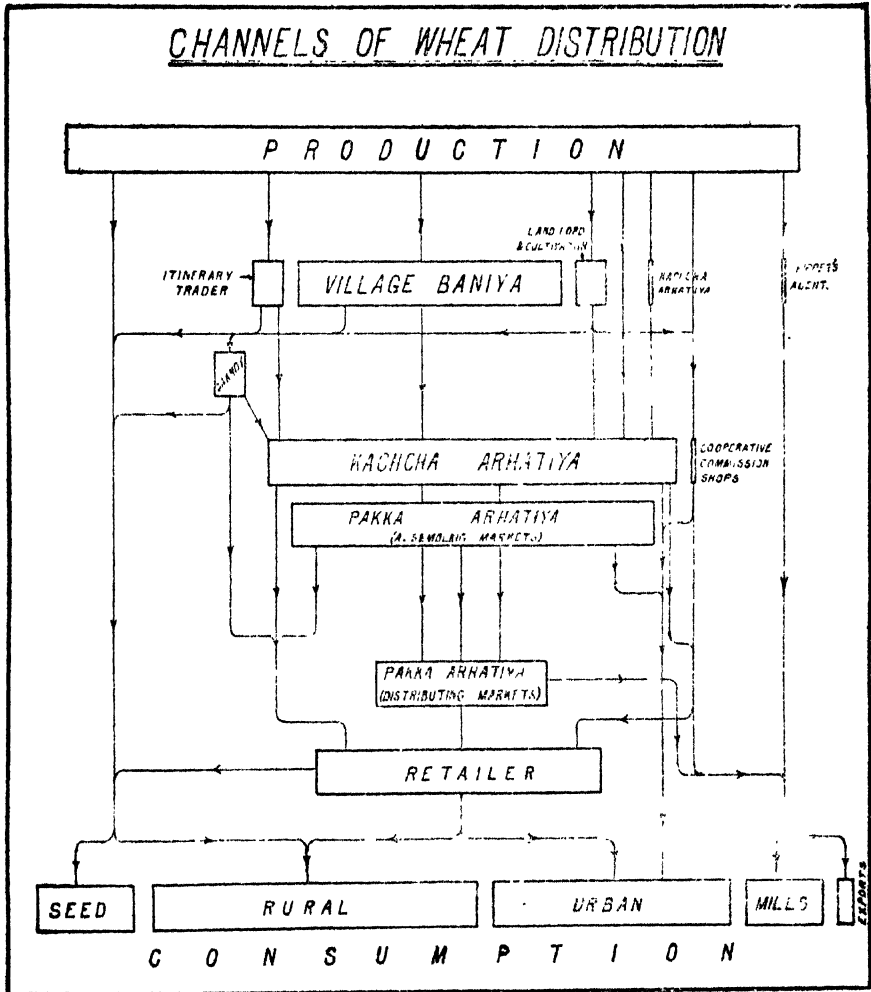
The *pakka arhatiya* is the chief factor in the internal distribution of wheat to retailers, to millers and to other wholesale merchants. Many *pakka arhatiyas* were found to be in touch with other *pakka arhatiyas* in the most distant places. For example, traders in Northern India have direct relations with those in Southern India and merchants in Central India consign wheat regularly to Madras and Mysore. When the *pakka arhatiyas* operate on their clients' account a certain amount of deposit is usually taken from and given by the buyer as earnest money, and on receipt of an order to buy, the *pakka arhatiyas* may, as the rate suits, either buy in the open market or appropriate their own firm's stocks against such an order. During the height of the season *pakka arhatiyas* may visit supplying centres personally or send a partner or other representative to examine the quality of the arrivals and make purchases on the spot. Frequently wheat is sent on commission sale to a consuming market and this is perhaps the most common practice throughout India. Where *pakka arhatiyas* have their own branch establishments sales can be conveniently effected. Enquiries from members of the most important grain trading associations at terminal consuming markets show that on an average not less than 50 per cent. of local supplies is consigned to them on commission sale. The great prevalence of this system appears to be partly due to the absence of recognised grades and the general lack of confidence in regard to quality.

Where a firm of *pakka arhatiyas* acts for a mill, the former is responsible to the mill for buying correctly, i.e., for the accurate estimation of refraction and for weights. These concerns are not necessarily the mills' sole buying agencies, for they may act as agencies also for others. Transportation and handling charges on such purchases are paid by the mill. In rare cases a mill may have its own buying organisation in which case the latter functions like a *pakka arhatiya* and also operates on behalf of other trade clients.

(4) CO-OPERATIVE ORGANISATIONS.

The co-operative commission shops in the Punjab function in very much the same way as the *kachcha arhatiya*, but do not transact business on their own account. As already noted the total quantity

CHANNELS OF WHEAT DISTRIBUTION



The above diagram has been drawn approximately to scale.

handled by these agencies is relatively small. No comment need, therefore, be made on their functions as distributors.

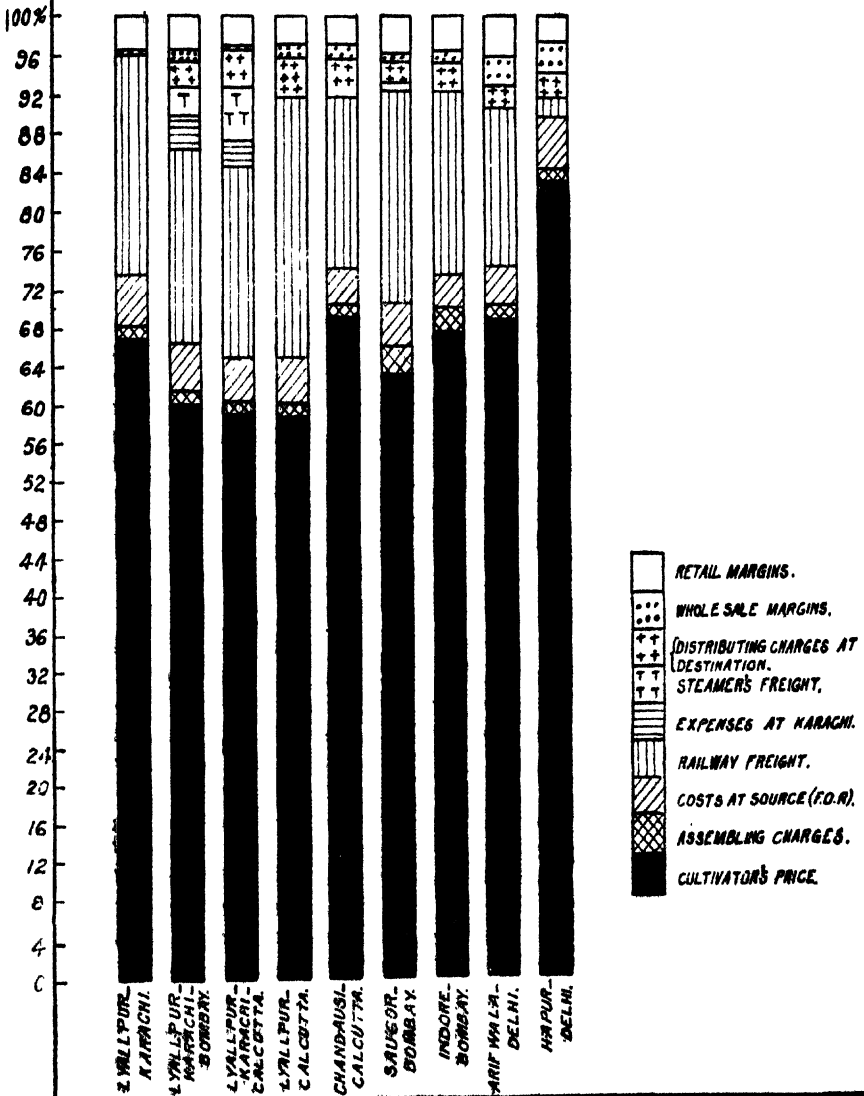
(5) EXPORTERS.

In former years when the export of wheat was regular and of considerable dimensions the export trade was almost entirely in the hands of four or five firms of international grain merchants whose operations in India were controlled from Europe, usually in London. Most of these concerns had widespread buying organisations upcountry which consisted of a number of agencies which in turn supervised the operation of a larger number of sub-agencies staffed with the exporter's own personnel. This system was very common during the pre-war years and for some time after the war, when not only wheat but other food grains such as barley and gram and oilseeds, *e.g.*, rapeseed, toria, linseed, were in large demand abroad. An alternative method of making purchases in the interior was through "guarantee" brokers working on the lines of *arhatiyas* or commission agents. This system was less in vogue in pre-war and early post-war years, but with the virtual disappearance of wheat exports since 1930 synchronising with the depression period, some modification was brought about in the old established machinery for purchasing agricultural commodities. A large number of sub-agencies had to be closed down as uneconomic and greater reliance had to be placed on a cheaper method of contact with upcountry markets, namely, through "guarantee" brokers or commission agents of repute who had their own shops or branches at various centres. In consideration of a pre-arranged rate of commission these agents are required to guarantee the due fulfilment of all contracts entered into by them on behalf of their exporter-principals with whom they maintain a security deposit usually in the form of a substantial sum in cash.

This change is also significant as indicating a change in buying practice. When exporters had their own organisations staffed with their own employees at all important centres, large purchases were made directly from the producer through *kachcha arhatiyas* in small units and the proportion of such purchases was considerable. Under present conditions the volume of direct ready purchases upcountry has fallen to comparatively insignificant proportions and has been largely replaced by the "Port Pass" contract the main features of which have already been discussed in Chapter VI. The "Port Pass" method of consigning produce to the port headquarters of the purchaser is popular with sellers at distant outstations and it is estimated that not less than three-fourths of the total quantity of wheat handled by shippers is normally consigned on these terms.

In addition to buying ready wheat from daily bulk arrivals and ready railway receipts or forward deliveries on the "Port Pass" system, a certain amount of trade is also done on "agency pass". As the name signifies, "agency pass" implies that the goods are analysed, approved, weighed over and the final payment effected on the spot by the exporter's local agency. In a few cases wheat used also to be bought on "station pass" terms which meant that the seller gave delivery at the railway station and the goods were inspected and passed finally at that point.

TYPICAL PRICE STRUCTURES BETWEEN IMPORTANT SURPLUS & CONSUMING MARKETS



The purchase of wheat, or any other agricultural commodity, on "ready" or "upcountry pass" conditions implies a considerable amount of skill and experience on the part of the buying agent, and broker, and any difference between the analysis or outturn results between the upcountry agency and the port, would either be a dead loss to the exporter should the buying upcountry have been injudicious and the analysis too lenient, or would show a profit if the goods either weighed more on arrival at Karachi or analysed lower. This method of purchasing had therefore to be closely supervised by constant visits of inspection by the firm's officials who were usually posted at convenient centres in the buying areas, when the purchases of the agent were analysed and compared with the costs at which such purchases had been advised against headquarters' limits. On the other hand purchases on "port pass" system calls for no particular technical skill at all in the upcountry agent as the goods are neither weighed nor analysed at origin.

B.—Finance of wholesale distribution.

(1) GENERAL

The distribution of wheat from the assembling to the terminal markets is mainly financed by wholesale merchants who also function as commission agents and by shippers during periods when exports are taking place. The actual provision of funds is effected through *shroffs* or money lenders and the modern joint stock banks which in recent years have greatly extended their activities. The distribution of wheat by the grower direct involves no special provision of finance as the quantities involved are generally too small to be traded in on any basis other than cash.

(2) *Arhatiyas*.

The *pakka arhatiyas*, who are the main distributing agents, are firms of some substance and, in addition to dealing in a number of commodities such as grains, seeds, ghee, sugar, etc., they may frequently operate as *shroffs*, making advances and discounting *hundis* or drafts and bills of exchange. The *pakka arhatiyas* are estimated to handle nearly four million tons of wheat or roughly 80 to 85 per cent. of the total quantity marketed and roughly half the volume of trade which passes through the *pakka arhatiyas*' hands is destined for *pakka arhatiyas* in other markets, millers and shippers and exporters. The remaining half is distributed for local consumption through *kachcha arhatiyas*, village merchants, town retailers, or to consumers direct.

In a number of cases the working capital of the *pakka arhatiya* may be augmented by deposits mainly from the relations and acquaintances of the firm's proprietors. Sound firms of long standing some times have large sums so deposited with them and in the slack season they have been known to refuse deposits or accept them only at nominal rates of interest. The customary rate of interest is, however, 6 per cent., on which terms probably about three-fourths of their deposits are accepted. In other instances the rates are settled according to the financial circumstances of the parties and may vary

from 3 to 9 per cent. per annum. In certain cases deposits from widows and minors may be held in trust without interest being given thereon.

The large firms of *arhatiyas* finance the internal movement of wheat to a considerable extent. Current accounts are maintained with them by their clients at other markets and the rate of interest on outstanding balances is usually 9 per cent. per annum. *Arhatiyas* in important assembling centres often purchase wheat on behalf of clients in distant parts of the country and usually receive earnest money at the rate of about one-fourth of the value of the purchases. This is done in order to cover possible losses due to price fluctuations, and the disbursement of market charges, railway freight, etc. Those clients who are old customers are often not required to keep such deposits. The total disbursements of the buying agent or *arhatiya* are recovered with interest from his client. When goods are consigned to distant markets on their own account for commission sale by *arhatiyas*, an advance of anything between 70 and 85 per cent. of the value is drawn against the consignee. This advance and the interest thereon is adjusted when the final accounts of the whole consignment are made out.

(3) *Shroffs*.

These indigenous banking houses play a most important part in the financing of the internal trade in agricultural produce. Most of the *shroffs* belong to the *Marwari*, *Multani* or *Sindhi* communities and are established in large numbers in practically all the chief markets of the country and particularly at the terminals in Karachi, Bombay, Madras and Calcutta. The *chettiers* of South India are also a powerful and influential factor in the finance of the internal trade in South India and in Burma where many of this community have long established themselves. Some of the *shroffs* are of very old standing. For example, the famous firm of Gurwalas at Delhi although recently gone out of business originally came to the city of Delhi during the 17th century at the invitation of the Moghul Emperor, Shah Jehan. Many of these *shroff* firms are also engaged in the wholesale grain or cloth trade and appear to have entered this line because their original business has been encroached upon by the comparatively recent spread of the modern banking system which provides special facilities for the remittance of funds between distant markets. One of the main activities of *shroffs* is to discount *hundis*, demand drafts or bills and advance money on promissory notes. On occasions loans are also granted against stocks of produce and the procedure followed is similar to that practised by the banks. (See Chapter V.)

(a) *Hundis*.—The *hundi* system is more or less peculiar to India. There are two kinds of *hundis*, the *mudatti hundi* and the *darshani hundi*. The former is a long-term document and is generally drawn for a fixed period, while the latter is the equivalent of a sight-draft usually payable on presentation. The *mudatti hundis* are drawn up on Government stamped paper, the stamp duty payable being Re. 0-1-6 per cent. up to amounts of Rs. 2,500 and Rs. 2-4-0 for every Rs. 2,500 over the sum first mentioned. *Darshani hundis*

may be drawn up on any kind of paper but most of the concerns which participate in the financing of trade to any extent have specially printed forms for the purpose. (Specimen on opposite page.)

(i) *Mudatti hundi*.—The most important instrument of credit handled by *shroffs* is the *mudatti hundi*. *Mudatti hundis* may be variously drawn for 21 to 61 days though there is no legal or customary bar to drawing them for any other period. In practice they are never drawn for more than one year.

In the case of *mudatti hundis* the discount rates charged by the joint stock banks ordinarily vary from one to one and a half per cent. over the bank rate. But the *shroff's* rates differ very widely according to the status of the drawer. Their normal rates are anything up to four per cent. higher than the bank rate. Discount is always payable in advance and is deducted from the amount paid.

The rate of brokerage on a *hundi* varies from 3 pies to 6 pies per hundred rupees. Weak parties are sometimes charged a very heavy brokerage which may amount to as much as Rs. 5 per cent. In the discount business brokers play a very important rôle and the clients of highly reputable brokers are given preference by the best of the *shroffs*.

It is noteworthy that the security against advances by *shroffs* is mainly personal. The *shroff* adjudges the worth of the party seeking credit by taking into consideration the latter's business stability and status and financial position. *Shroffs* are usually more liberal in allowing credit than the banks. However, in order to safeguard themselves against possible risks only *hundis* having at least one endorsement are accepted, while sometimes two, three or even four endorsements are insisted upon in order to minimise the risk. The *shroff* has to satisfy himself that the drawer or the endorser or endorsers will be able to honour the draft on maturity. The endorsement of *hundis* is arranged with friends or neighbouring firms. Occasionally endorsers may demand a heavy consideration for their endorsements, but this is not a normal feature. The inability to honour one's draft is considered a very serious event and virtually amounts to a declaration of insolvency.

(ii) *Darshani hundis* are the sight drafts of ordinary day to day business and in their universality in India may be compared to the cheque in Europe and the West. Short term credits are also raised on the basis of *darshani hundis*, by drawing them on distant markets or on places where such *hundis* are allowed a considerable period of grace. No revenue duty is payable on *darshani hundis*, which, as mentioned, are usually written on special forms. The brokerage charges vary from 3 to 6 pies per cent. which are paid mostly by the buyer or whoever discounts the *hundi*.

Darshani hundis are generally payable on presentation but in some markets a few days of grace are also allowed. For example, the *darshani hundis* payable at Delhi bear seven days of grace and are payable on the 8th day after acceptance, subject to interest at the rate of Rs. 5-12-0 per cent. per annum. The acceptance of the payee is obtained soon after receiving the draft. In Bihar on the other hand they are payable on the day immediately following

Himatsingh Jagannath Brass Merchants.

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1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$
 2. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$
 3. $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$
 4. $\frac{1}{2} \times \frac{1}{8} = \frac{1}{16}$
 5. $\frac{1}{4} \times \frac{1}{8} = \frac{1}{32}$
 6. $\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$
 7. $\frac{1}{2} \times \frac{1}{16} = \frac{1}{32}$
 8. $\frac{1}{4} \times \frac{1}{16} = \frac{1}{64}$
 9. $\frac{1}{8} \times \frac{1}{16} = \frac{1}{128}$
 10. $\frac{1}{2} \times \frac{1}{32} = \frac{1}{64}$
 11. $\frac{1}{4} \times \frac{1}{32} = \frac{1}{128}$
 12. $\frac{1}{8} \times \frac{1}{32} = \frac{1}{256}$
 13. $\frac{1}{2} \times \frac{1}{64} = \frac{1}{32}$
 14. $\frac{1}{4} \times \frac{1}{64} = \frac{1}{256}$
 15. $\frac{1}{8} \times \frac{1}{64} = \frac{1}{512}$
 16. $\frac{1}{2} \times \frac{1}{128} = \frac{1}{64}$
 17. $\frac{1}{4} \times \frac{1}{128} = \frac{1}{512}$
 18. $\frac{1}{8} \times \frac{1}{128} = \frac{1}{1024}$
 19. $\frac{1}{2} \times \frac{1}{256} = \frac{1}{128}$
 20. $\frac{1}{4} \times \frac{1}{256} = \frac{1}{1024}$
 21. $\frac{1}{8} \times \frac{1}{256} = \frac{1}{2048}$
 22. $\frac{1}{2} \times \frac{1}{512} = \frac{1}{256}$
 23. $\frac{1}{4} \times \frac{1}{512} = \frac{1}{2048}$
 24. $\frac{1}{8} \times \frac{1}{512} = \frac{1}{4096}$
 25. $\frac{1}{2} \times \frac{1}{1024} = \frac{1}{512}$
 26. $\frac{1}{4} \times \frac{1}{1024} = \frac{1}{4096}$
 27. $\frac{1}{8} \times \frac{1}{1024} = \frac{1}{8192}$
 28. $\frac{1}{2} \times \frac{1}{2048} = \frac{1}{1024}$
 29. $\frac{1}{4} \times \frac{1}{2048} = \frac{1}{8192}$
 30. $\frac{1}{8} \times \frac{1}{2048} = \frac{1}{16384}$
 31. $\frac{1}{2} \times \frac{1}{4096} = \frac{1}{2048}$
 32. $\frac{1}{4} \times \frac{1}{4096} = \frac{1}{16384}$
 33. $\frac{1}{8} \times \frac{1}{4096} = \frac{1}{32768}$
 34. $\frac{1}{2} \times \frac{1}{8192} = \frac{1}{4096}$
 35. $\frac{1}{4} \times \frac{1}{8192} = \frac{1}{16384}$
 36. $\frac{1}{8} \times \frac{1}{8192} = \frac{1}{65536}$
 37. $\frac{1}{2} \times \frac{1}{16384} = \frac{1}{8192}$
 38. $\frac{1}{4} \times \frac{1}{16384} = \frac{1}{65536}$
 39. $\frac{1}{8} \times \frac{1}{16384} = \frac{1}{131072}$
 40. $\frac{1}{2} \times \frac{1}{32768} = \frac{1}{16384}$
 41. $\frac{1}{4} \times \frac{1}{32768} = \frac{1}{131072}$
 42. $\frac{1}{8} \times \frac{1}{32768} = \frac{1}{262144}$
 43. $\frac{1}{2} \times \frac{1}{65536} = \frac{1}{32768}$
 44. $\frac{1}{4} \times \frac{1}{65536} = \frac{1}{131072}$
 45. $\frac{1}{8} \times \frac{1}{65536} = \frac{1}{262144}$
 46. $\frac{1}{2} \times \frac{1}{131072} = \frac{1}{65536}$
 47. $\frac{1}{4} \times \frac{1}{131072} = \frac{1}{131072}$
 48. $\frac{1}{8} \times \frac{1}{131072} = \frac{1}{262144}$
 49. $\frac{1}{2} \times \frac{1}{262144} = \frac{1}{131072}$
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 51. $\frac{1}{8} \times \frac{1}{262144} = \frac{1}{524288}$
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 54. $\frac{1}{8} \times \frac{1}{524288} = \frac{1}{1048576}$
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 62. $\frac{1}{4} \times \frac{1}{4194304} = \frac{1}{1048576}$
 63. $\frac{1}{8} \times \frac{1}{4194304} = \frac{1}{1048576}$
 64. $\frac{1}{2} \times \frac{1}{8388608} = \frac{1}{4194304}$
 65. $\frac{1}{4} \times \frac{1}{8388608} = \frac{1}{1048576}$
 66. $\frac{1}{8} \times \frac{1}{8388608} = \frac{1}{1048576}$
 67. $\frac{1}{2} \times \frac{1}{16777216} = \frac{1}{8388608}$
 68. $\frac{1}{4} \times \frac{1}{16777216} = \frac{1}{4194304}$
 69. $\frac{1}{8} \times \frac{1}{16777216} = \frac{1}{4194304}$
 70. $\frac{1}{2} \times \frac{1}{33554432} = \frac{1}{16777216}$
 71. $\frac{1}{4} \times \frac{1}{33554432} = \frac{1}{8388608}$
 72. $\frac{1}{8} \times \frac{1}{33554432} = \frac{1}{4194304}$
 73. $\frac{1}{2} \times \frac{1}{67108864} = \frac{1}{33554432}$
 74. $\frac{1}{4} \times \frac{1}{67108864} = \frac{1}{16777216}$
 75. $\frac{1}{8} \times \frac{1}{67108864} = \frac{1}{8388608}$
 76. $\frac{1}{2} \times \frac{1}{134217728} = \frac{1}{67108864}$
 77. $\frac{1}{4} \times \frac{1}{134217728} = \frac{1}{33554432}$
 78. $\frac{1}{8} \times \frac{1}{134217728} = \frac{1}{16777216}$
 79. $\frac{1}{2} \times \frac{1}{268435456} = \frac{1}{134217728}$
 80. $\frac{1}{4} \times \frac{1}{268435456} = \frac{1}{67108864}$
 81. $\frac{1}{8} \times \frac{1}{268435456} = \frac{1}{33554432}$
 82. $\frac{1}{2} \times \frac{1}{536870912} = \frac{1}{268435456}$
 83. $\frac{1}{4} \times \frac{1}{536870912} = \frac{1}{134217728}$
 84. $\frac{1}{8} \times \frac{1}{536870912} = \frac{1}{67108864}$
 85. $\frac{1}{2} \times \frac{1}{1073741824} = \frac{1}{536870912}$
 86. $\frac{1}{4} \times \frac{1}{1073741824} = \frac{1}{268435456}$
 87. $\frac{1}{8} \times \frac{1}{1073741824} = \frac{1}{134217728}$
 88. $\frac{1}{2} \times \frac{1}{2147483648} = \frac{1}{1073741824}$
 89. $\frac{1}{4} \times \frac{1}{2147483648} = \frac{1}{536870912}$
 90. $\frac{1}{8} \times \frac{1}{2147483648} = \frac{1}{268435456}$
 91. $\frac{1}{2} \times \frac{1}{4294967296} = \frac{1}{2147483648}$

$\frac{22}{2} \times 6 \times 4 = 264$
 $\frac{22}{2} \times 4 \times 6 = 264$
 $\frac{22}{2} \times 6 \times 4 = 264$

$$E = mc^2$$

शुभ स्थान

உதாரணம்

230

निमेष ० ५५३७

के देने देना यहां रखे भाई

५६ लला ५६ बल्लभ ५६ क

मिति

हृण्डी पडुंचे तुरन्त साह
जोग चलन बाजार ठिकाने लगाये चौकस कर
दाम देना ।

2014/11/14

सं० १९५३

हस्ताक्षर १०/२६/७३

दी प्रिन्स लिमिटेड, मुम्बई।

Translation of a typical *Darshani Hundi* (Demand draft)
printed on reverse.

(Himatsingh Jagannath Brass Merchants).

Hundi

**

On Demand

No.

Specimen signature }
of drawer.

With the grace of God Messrs. (*Drawee*) of.....
.....the auspicious place, may be pleased to
accept the compliments of Messrs. (*Drawer*)
of..... Further, a Hundi is drawn on you
for Rs.....(in words) Rupees.....
half of which reckon as Rs. (in words).....
double of which is payable in favour of Messrs.....
(*Payee*)..... Hundi (date.)...
On receiving the Hundi please pay immediately the amount in
current coin after ascertaining the respectability and identity (of
the payee).

Hundi dated (Vikrami calendar).

Dated (English calendar).

Drawer's Signature.

presentation but it is stated that sometimes two or three days of grace are allowed by local usage.

(b) *Promissory notes*.—Sometimes, in order to save the stamp duty, capital is raised on promissory notes. This is only done when large amounts are involved. A promissory note is considered a better means of obtaining advances, as it is a non-negotiable instrument and consequently does not entail the same publicity as the *hundi*. The rules regarding payment are not very strict and in fact firms which are able to obtain advances on promissory notes will seldom finance themselves on the basis of *hundis*. Some *shroffs* who take advances from banks on the basis of these *hundis* do not accept promissory notes as these are not negotiable instruments.

(4) BANKS.

In addition to the provision of credit against the security of pledged stocks (*see* Chapter V), the banks also buy and discount *hundis* or drafts, remit money by telegraphic transfer from one centre to another and in general provide all the accommodation necessary for the conduct of trade. Banks do not, however, generally advance loans against *mudatti hundis* or currency drafts. For example, out of the twelve commercial banks operating in Delhi only four or five are known to make any appreciable advances on *mudatti hundis*. The Bank fixes the credit limits of the drawers after making close enquiries regarding their business and financial status, the amount and value of landed property owned by the proprietor or partners, the turnover, etc. The approved firms are then allowed to draw money from their bankers up to their limit of credit on the basis of these currency drafts or promissory notes. Such credit is not, however, enjoyed by every firm and a small concern may sometimes arrange to obtain advances from a bank through a larger firm which has an approved credit with the bank. The bank advances money on the security of the approved party who then endorses his client's drafts and thus guarantees them. The *shroff* and the modern banks work side by side but more or less independently of each other. Although the importance of the *shroff* may have declined to some extent with the extension of the modern banking system, he still plays a greater part in financing the internal trade of the country than the joint stock banks. The present position of the *shroff* is in part, due to the fact that modern banking facilities are not available at all important trade centres. For example, out of 2,572 towns in India with a population of 5,000 and over, in less than 830 are there branches of a bank. By far the more potent reason, however, is the intimate knowledge possessed by the *shroff* of the family history of his clients and the details regarding their business and financial position afforded by daily social contact. This enables him to extend credit facilities much more easily on personal security than is possible for any modern bank. Moreover after making loans the behaviour of his clients and the manner in which the money is utilised, is constantly under his observation. Further, the *shroff's* services are available at all times and clients can have free access without the formalities and delay such as occurs at the counters of practically all the joint stock banks. The *shroff's* rates

of discount do not on the whole compare unfavourably with those of modern banks. His establishment is small and working costs low.

The different ways in which *shroffs* help the trade have already been discussed. Their functions are complementary to those of the joint stock banks whose further expansion may be regarded as desirable by all interested, particularly as the efficiency of many large *shroff* firms depends to a great extent upon the accommodation obtainable from the modern banks.

As was brought out by the Banking Enquiry Committee in 1929 there is a room for improving the efficiency and extent of the *shroff's* business. The main lines on which improvement might be effected are :—

- (1) Licensing of *shroffs* who agree to operate on purely banking business. (Participation in any kind of trading involves risk which shakes the confidence of the clients and is against the fundamentals of banking practice.)
- (2) Formation of associations to standardise business practices.
- (3) Provision for better discounting facilities and co-operation with joint stock banks.

So far as modern joint stock banks are concerned, apart from a few exceptional cases they appear to have confined themselves mainly to the industrial sphere and to the trade in the larger cities and towns. Modern banking facilities are not available in the smaller towns—much less in the villages and country markets. In England it is not uncommon for banks to send a cashier and clerk to attend a country market for the day to receive and pay out cash. No exact counterpart of this practice has been met with in India during the course of this survey, although there are a number of small pay offices in some of the lesser markets at which facilities for the collection and discounting of *hundis* are available. Some of the joint stock banks also maintain godown keepers at certain markets to watch over their interests where advances have been made against the security of pledged stocks of produce. Until joint stock banks are prepared to extend their activities in the lesser towns and larger villages they are not likely to play any vital part in the process of agricultural marketing.

(5) EXPORTERS.

The two or three international firms of grain merchants, who, between them, handle practically the entire wheat export trade provide themselves with funds in India by selling sterling bills of exchange, usually drawn at three months sight, or telegraphic transfers to those banks which handle foreign exchange at the various port headquarters of the firms in question. Another source of local funds springs from the import trade. Wheat, sugar and piece-goods are important commodities handled by these international firms. At one time quantities of wheat were shipped to India from Australia and the importation of sugar from Java and the continent of Europe was a trade of considerable magnitude. Piece-goods are still a fairly large item in India's import trade and the money

received against sales of these commodities was, and still is, utilised for the purpose of buying indigenous produce or, where receipts exceed local requirements, the surplus funds are remitted to London by the purchase of sterling telegraphic transfers.

Upcountry buying agencies are normally financed by the sale locally of the firm's *hundis* or drafts drawn on the port headquarters, or funds may be remitted by telegraphic transfer through the Imperial Bank of India or other exchange banks. In former years currency notes, in halves for greater safety, were often sent by registered post or messenger from the upcountry headquarters of the shippers to some of the smaller sub-agencies or outstations, the second halves being forwarded only after acknowledgment of the receipt of the first halves. Specie in the form of silver used also to be sent to buying centres under escort of two or more messengers, but since the spread of banking facilities and the increased circulation of coin and currency notes measures such as those just described are rarely followed at the present time.

(6) REMITTANCES.

The adequate provision of funds and quick and cheap transfers from the centres of consumption to the supplying markets are other factors of importance in the system of distribution. In practice, however, only a small portion of the total value of the produce is required to be remitted from one centre to another owing to the balanced nature of the trade. Remittances may be made by means of *darshani hundi* or bank drafts, telegraphic transfer or by actually remitting cash under registered and insured cover. The latter practice is followed only where small amounts are involved and in the case of markets where ordinary banking facilities do not exist.

The *darshani hundi* is by far the most important instrument of credit for the adjustment of trade accounts between different markets. The consignee may purchase a *darshani hundi* payable at the consignor's market or, as more often happens, the consignor may draw on the consignee and discount the *hundi* in his own market or with some local bank. Banks normally make advances only against such *hundis* as are accompanied by railway receipts.

It is usually customary for consignors to send railway receipts for collection through a bank if there happens to be a branch in the consignee's market. The receipt is accompanied by a *darshani hundi* drawn on the consignee and it is only delivered to the latter when the *hundi* has been duly honoured by him. An alternative method of receiving payment for goods despatched is for the receipt and the accompanying *hundi* to be forwarded for collection to some reliable firm at destination. This is the normal procedure wherever regular banking facilities are not available. In certain cases where the relations between consignor and consignee are satisfactory, or of long standing, railway receipts may be sent direct to the latter. Where the value of a consignment is small, below Rs. 100 for example, the railway receipt may be forwarded by V. P. P. (value payable by post). For goods consigned on commission sale the usual custom is to draw on the consignee to the extent of 75 to 80 per cent. of the

invoice value, and where goods are specifically consigned to order the full value is usually drawn.

When there is a heavy demand for making remittances to any particular market *hundis* payable at that place are often sold at a premium (*badha*), e.g., a *hundi* for one hundred rupees may be obtainable for, say, Rs. 100-2-0. If there is little or no demand the draft may sell at a discount (*batta*) and may be obtained for, say, Rs. 99-14-0. The limits of premium and discount are determined by the cost of making remittances by bank drafts, that is to say, if a draft on Calcutta is obtainable in Bombay at 2 annas per cent. the premium on Calcutta *hundis* will not ordinarily exceed that figure. In the case of markets where there are no established banks, the discount and premium limits are rather wider and may rise even to 1 per cent. *Hundis* drawn or endorsed by well-known firms are usually discounted at rather more favourable rates. On the whole the average cost of making remittances may be reckoned as about one anna per cent.

Remittances are also made by means of bank drafts or cash sent by insured registered post. The minimum bank charge is 4 annas per cent. if the draft required is for a small sum, but the rate of commission is less on large amounts and may be as low as 6 pies per cent according to the amount of the draft and the position of the bank's funds.

C.—Cost of Wholesale Distribution.

The cost of distribution includes the expenses of transportation and handling from the point of delivery to the buyer's premises, the cost of the containers, twine for sewing the mouths of the bags, the *arhatiya's* commission, brokerage and sundry charges such as fees for correspondence, clearing charges, etc.

When making purchases for buyers in outside markets these items of expenses fall into three distinct categories, viz., (a) expenses incurred in the buying market up to the point when the goods are put on rail at the station, (b) railway freight to destination and (c) cartage therefrom to the buyer's godown, handling and stacking, and octroi or terminal tax, where levied.

As a general rule all these charges are paid in cash by the buyer or by his agent (*pakka arhatiya*). The rates for these different items vary not only from market to market but also in the same market according to the individual relations between the *arhatiya* and his customer. Consequently the total cost of distribution between one market and another is rarely, if ever, constant. It may, however, be observed that the variation in these charges are on the whole not nearly so pronounced as assembling costs and the reason would appear to be that the contracting parties in the distribution stage are better equipped and organised than the smaller agencies which so largely participate in assembling.

When direct sales are effected by cultivators or village merchants to consumers in their own villages, distribution costs are practically negligible. If, however, transactions are effected through the village weighman, as may often happen in parts of the Punjab, the buyer

has to pay *tulai* at a rate which is usually 3 pies per rupee. In other circumstances produce is weighed over by one or other of the parties and transported to the buyer's place by his own employees.

In the large wholesale markets where, particularly during the season, miller's agents, shippers, retailers and even in some cases consumers themselves may purchase directly from the village sellers, through the *kachcha arhatiya*, the charges payable are exactly the same as the assembling charges already discussed. To these obviously should be added the expenses of transporting the goods to the station and the other incidental charges which fall on the wheat until it reaches its final destination. The rates of cartage to and from the stations in the various markets of India were found to vary considerably depending both upon the intervening distances and also on the local rates of wages. The extreme range of variation for cartage was found to be a low point of Re. 0-0-1 per maund and a high of Re. 0-1-0 per maund. The average charge, however, in the greater number of markets seems to place the total costs of cartage and handling at both despatching and receiving rail-head points at between six and nine pies per maund including a small item for clearing fees (*hundiana*) which are paid to a *hundikari* or station broker who attends to these formalities, and saves the consignor or consignee the trouble of going to the station and personally forwarding or taking delivery of the goods.

More than half of the marketable surplus passes through the *pakka arhatiya*'s hands (see diagram on page 253) and as such the costs of distribution are of relatively great importance particularly in reference to the wheat which is conveyed to distant markets. When purchases are made through this agency the normal rate of commission ranges in most markets between Re. 0-12-0 and Rs. 1-4-0 per cent. in addition to what may have been paid to the *kachcha arhatiya* or any other market functionary. All of these are charged up to the final buyer. Certain other charges such as brokerage, charity and correspondence, are also levied on their customers by the *pakka arhatiya*. Thus some items such as commission, charity, etc., are paid more than once or indeed as many times as the goods change hands. For example at Hapur the buyer has not only to pay *dami* for the *kachcha arhatiya* but also commission to the *pakka arhatiya*. In practice, however, the *pakka arhatiya* invoices his buyer at fixed rates for the various services performed. Usually these rates are slightly higher than the actual costs and constitute a small margin for the *arhatiya*.

Pakka arhatiyas also arrange for the supply of gunnies and twine, the cost of which is debited to the buyer's account. Buyers are also charged interest usually at the fixed market rate on such amounts as the *pakka arhatiya* may pay out on his behalf.

It is interesting to note that even in those cases in which the *pakka arhatiya* works as a principal all the customary deductions are included in the invoice and recovered from the buyers; the price quotations from different markets are therefore always regarded in the trade as subject to a scale of charges which varies from market to market.

In order to illustrate the various charges which have formed the subject of discussion a copy of an invoice relating to wheat purchased at Arifwala in the Punjab by a Delhi merchant and imported into Delhi on the latter's own account is given below :—

Invoice for 194 bags of wheat weighing 509 maunds 10 seers net.

	Rs.	a.	p.	Rs.	a.	p.
Prime cost*	1,091	6	0			
<i>Charges at origin (Importer's account).</i>						
(a) Arhat (commission) @ Re. 0-8-0 per cent. ..	5	7	0			
(b) Dharmada and gaushala (charity and cattle home) @ Re. 0-1-3 per cent.	0	13	6			
(c) Postage (fixed charges)	0	4	0			
(d) Labour (filling and sewing) @ Rs. 1-8-3 per 100 bags	3	0	6			
(e) Cartage (from Arifwala market to railway station)	4	8	9			
(f) Twine (for stitching the bags)	0	11	6			
(g) Miscellaneous charges at railway station ..	3	0	6			
Total cost at origin				1,109	3	9
<i>Expenses at Delhi (Importer's account).</i>						
(h) Railway freight @ Re. 0-8-6 per maund ..	273	11	0			
(i) Terminal tax @ 6 pies per maund	15	14	9			
(j) Cartage from station to shop @ 7½ pies per bag	7	9	0			
(k) Labour (unloading and stacking @ 3 pies per bag)	3	0	0			
				300	2	9
Total cost at Delhi delivered at importer's godown ..				1,409	6	6

The total cost of importing (including the railway freight) was, therefore, Rs. 318-0-6 or 29.15 per cent of the prime cost, whereas excluding the railway freight it was Rs. 44-5-6 or 4 per cent.

When a sale is made the importer who now becomes the seller will have to pay *dharmada* and *gaushala* at Re. 0-1-6 per cent as well as labour and weighing charges at 6 pies per bag in equal parts in accordance with the prevailing system throughout the Delhi market. This makes up the total cost of distribution Rs. 51-10-6 or 4.7 per cent. of the prime cost.

When wheat is despatched for commission sale all the expenses of placing the goods at destination are borne by the consignor or owner, who is also responsible for paying commission to the *pakka*

*The gunny bags were provided by the buyer.

arhatiya who arranges for the sale or disposal of the consignment, and also items at destination such as godown rent, brokerage, charity, etc. Interest on advances made by the *pakka arhatiya* to the consignor as well as small sums which the former disburses on the latter's behalf in the course of receiving and storing the wheat are also invoiced against the consignor in due course. At most markets in which it is customary for buyers to pay *dami* the *pakka arhatiya* does not charge the seller any commission. This for instance is the usage at Delhi.

Below is given a copy of an actual invoice covering goods sent to Delhi for commission sale :—

Account relating to a parcel of 36 bags of wheat weighing 90 maunds net sent from a country station in the Punjab to Delhi for commission sale.

	Rs.	a.	p.
<i>Charges.—</i>			
(a) Railway freight	23	7	0
(b) Terminal tax @ 6 pies per maund	2	13	0
(c) Miscellaneous charges at the railway station	0	4	6
(d) Cartage from station to shop @ 10½ pies per bag	1	15	6
(e) Labour (unloading and stacking) @ 3 pies per bag	0	9	0
(f) Weighing @ 3 pies per bag	0	9	0
(g) <i>Dharmada</i> (charity) @ Re. 0-1-0 per cent.	0	3	0
(h) <i>Gaushala</i> (cattle home) @ 6 pies per cent.	0	1	6
(i) <i>Panchayat</i> fee @ 3 pies per cent.	0	0	9
(j) Postage (actual)	0	4	0
Total charges on 90 maunds	30	3	3

or Re. 0-5-4 per maund.

This particular consignment realised Rs. 277-7-0 gross and therefore, the net return to the seller after deducting the above charges was Rs. 247-3-9. This amount was credited to the latter's account in the commission agent's books and he was supplied with a copy of this invoice. The total cost of distribution works out to 12.2 per cent of the net return to the sender while it is 2.7 per cent if railway freight be excluded.

Another instance of a sale of wheat on commission may be quoted from Sind. This illustrates the cost of distribution to an up-country farmer who disposes of his produce in Karachi.

Account relating to a parcel of 212 bags of wheat weighing 556 maunds (maund of 41 seers) sent from an upcountry market in Sind to Karachi for commission sale.

	Rs.	a.	p.	Rs.	a.	p.
<i>Expenditure at source—</i>						
Cost of 212 bags (Rs. 30 per 100)	63	9	0			
Twine and sewing (Re. 0-0-3 per bag)	3	5	0			
Weighing on the farm (Re. 0-0-6 per maund) ..	17	6	0			
Cartage from farm to station (2 annas per maund)	69	8	0			
Loading and miscellaneous charges at the station (Rs. 4 per 100 bags)	8	8	0			
	<hr/>				162	4 0
Railway freight to Karachi					223	3 6
<i>Expenses at Karachi—</i>						
Octroi	9	2	0			
<i>Makadami</i> (handling)	1	8	0			
Stacking	2	10	6			
<i>Bardana</i> allowance (Rs. 2 per 100 bags)	4	4	0			
Brokerage	2	4	9			
Weighing charges	1	13	9			
<i>Dharmao</i> (charity)	0	8	6			
Godown rent	20	9	6			
Commission agent	8	7	0			
Insurance	2	1	0			
Correspondence	0	12	0			
					54	1 0
	<hr/>				<hr/>	
Total charges on 556 maunds					439	8 6
	<hr/>				<hr/>	
or Re. 0-12-8 per maund.						

Sale proceeds—Rs. 1,691-13-0.

If railway freight is excluded from the calculation the cost of distribution works out to Re. 0-6-3 per maund or 18.5 per cent. of the prime cost of the wheat. This is much higher than in the Delhi example already quoted and is mainly due to such additional charges as commission, cost of gunny bags, and cartage at source. It will also be noticed that an item called "*bardana*" charge has been included in the invoice at the rate of Rs. 2-0-0 per 100 bags. This *bardana* allowance is generally levied at all large receiving centres and is an allowance to cover the difference between the value of new and second-hand bags, as mills' and shippers' contracts and indeed most of the contracts in vogue at the "futures" exchanges stipulate that a new bag shall be used. In the present instance it is significant that this allowance was levied although from the cost of the gunnies used it would appear that the original bags were brand new. It appears to be customary to levy a gunny allowance on practically every consignment irrespective of the true condition of the bags at the receiving point.

The costs of distribution between some of the more important markets in the surplus areas and large consuming centres are illustrated in the diagram on page 255 based on the data given in Appendix XLVIII. Reference to the latter will show that total costs vary from Re. 0-5-9 per maund between Hapur and Delhi, a distance of 35 miles only, to Rs. 1-7-2 between Lyallpur and Calcutta by rail. In these two examples railway freight is responsible for Re. 0-1-0 and Rs. 1-0-4 per maund respectively. Where the goods have to pass through more than one intermediate market the costs of merchandising are increased. An instance of this is to be seen in the Lyallpur and Calcutta prices when the wheat is railed first to Karachi and then shipped by sea. Although rail and steamer freight combined between Lyallpur and Karachi amounts only to Re. 0-14-9 per maund or Re. 0-1-7 less than for direct consignments by rail the lesser charge is more than counter-balanced by the cost of handling in Karachi.

D.—Grain Trade Associations and “Futures” Exchanges.

Organised trading in cereals has been in existence at Karachi, Bombay and Calcutta for many years but most of the Grain Trade Associations or Produce Exchanges handling “futures” transactions upcountry are of comparatively recent origin.

(1) NUMBER AND LOCATION.

The growth and development of the present trading associations in India as a part of the distributing system is an interesting commentary on the changing conditions of the grain trade since the War and an indication of the increasing importance of the internal market. In former years large and comparatively regular exports of wheat were a normal feature of India's foreign trade. By far the greater proportion of the export trade in grain and seeds rested in the hands of a few international firms of grain merchants, which maintained a widespread organisation of upcountry buying agencies at most of the important markets in the interior and frequently also at some of the more remote outstations where direct contact was often made with the producer. A large proportion of the saleable surplus in the locality was sold to these agents for cash and found its way directly into export channels. The interchange of market information, by telegram, between shippers' headquarters at the ports (in this case mainly Karachi) and the buying agency upcountry was a useful link between the markets in the interior and the outside world as reflected by shippers' buying limits. The ramifications of this system had an important effect in stabilising or at least in co-ordinating prices in different markets throughout the country. The need for “hedging” stocks as a form of insurance was not then greatly felt by dealers upcountry nor was it perhaps essential since a regular outlet was almost always available in the shape of the export demand.

With the War, however, conditions grew more unsettled. The normal channels of trade became disorganised and speculation, fostered by the prevailing uncertainties, began to increase. At the time, too, growing difficulties were experienced by legitimate traders. Defaults were of common occurrence and there were few markets

where organised trading with rules and regulations for the proper conduct of business existed. As far as can be ascertained the first attempt towards organisation in the Punjab came in 1920 when a Sugar and Grain Merchants Association was formed at Amritsar. This was followed two years later by the Sham Sunder Trading Co., Ltd., at Lyallpur in the same province. Rules for the conduct of trade were framed and circulated to members and others. Provision was also made for the settlement of disputes by arbitration. During this early period neither of these two associations provided any clearing-house facilities such as those in existence to-day for the adjustment of members' "long" and "short" accounts in "futures" transactions and for settlement of "differences". The first "futures" exchange to be formed in the Punjab with arrangements for the periodical clearance and adjustment of members' commitments was again at Amritsar when changes were made in the constitution of the old Sugar and Grain Merchants Association and it was converted more or less into its present form. In 1932 as a result of differences of opinion in the local trading community a new association was registered under the name of "The Amritsar Traders Guarantee Trust Co., Ltd.". The name of the original institution, i.e., "The Sugar and Grain Merchants Association", was then altered to "The Amritsar Produce Exchange, Ltd."*

During the intervening years, 19 other associations had been registered in various parts of the Punjab. Throughout this period the export trade in wheat had become more spasmodic and was steadily dwindling. With the development of rapid communication and the spread of banking facilities the means for storing large quantities of produce were created and a stimulus was given to speculation. This resulted in the rapid expansion of the number of "futures" exchanges, 61 new institutions being registered in the Punjab during the two years 1932 and 1933. These, however, lacked the experience of the organisations which had come into being at Amritsar and Lyallpur and in consequence a large number were unable to survive even a season's working. During the period 1934-35 almost half of these associations were either moribund or in a state of liquidation. The actual number of liquidations between 1930 and 1935 was 17, out of which 11 took place in 1934-35. As an example of the uncontrolled growth of these associations the position at Hissar, Sirsa, Giddarbaha and Abohar, all important markets in the south-east of the Punjab, shows that in all 20 of these institutions sprang up about the years 1932-33 of which 4 operated at Hissar, 3 at Sirsa, 6 at Giddarbaha and 7 at Abohar. All the 4 trading associations at Hissar have since disappeared, the Sirsa ones are no longer in existence, 3 out of the 6 at Giddarbaha have failed, while the fourth is moribund, and finally only 2 associations at Abohar now survive.

A statement of the total number of associations or exchanges known to be in existence at present is given in Appendix XLVII

*A third association has very recently been formed at Amritsar by former members of the Amritsar Traders Guarantee Trust Co., Ltd., and it is understood that the volume of "futures" trading at the latter association has seriously diminished.

together with details, where ascertainable, of units of transaction, margin money, their sources of revenue, profit and loss, total volume of trade in wheat and proportion of "futures" contracts settled by actual delivery. The list referred to contains the names and locations of 66 associations of which 41 are in the Punjab and of the remainder, 20 are in the United Provinces, 3 in Bombay, 1 in Calcutta and 1 in Karachi. The three Chambers of Commerce of Bengal, Bombay and Karachi and other kindred institutions are not included as their functions are not those of the type of trade associations under discussion. It is evident that at present the position of many of these bodies is more or less fluid and lacking in the stability to ensure confidence. Some are moribund or on the verge of liquidation, others again are in the process of creation and the position as regards their number and the extent of their activities varies from month to month.

By far the greater proportion of these associations are located in the Punjab and it is significant that there are no grain "futures" exchanges or any form of organised trading comparable, for example, with the Punjab in any of the other provinces or States. There are, it is true, a few other commodity exchanges such as those for cotton and oilseeds at Bombay, cotton at Indore, cotton and cotton seed at Nagpur and jute in Calcutta. Outside the ports, however, organised trade exists only over a relatively small part of India and mainly in the markets shown in Appendix XLVII.

Wheat is not the only commodity handled by the majority of the grain trade associations upcountry. Other agricultural products such as gram, barley, oilseeds, oilcake, cotton, sugar, gunnies and even vegetable oils such as mustard or toria oil are frequently traded in.* At the ports, however, individual associations usually handle different groups of commodities. In Bombay, for example, one body controls wheat and linseed "futures", a second administers "futures" transactions in oilseeds of other descriptions including linseed and a third regulates "futures" trading in cotton.

The terms and conditions imposed by these associations on their members and on all the transactions coming within their purview are similar in all main essentials and differ only in details. For example, the wheat tenderable is described, the months of delivery are specified, and the settlement dates, conditions and points of delivery laid down. The unit of transaction and the amount of "cover" or margin money to be deposited by the parties concerned is also specified. The basis of refraction which is an integral part of the contract is also fixed and the terms govern any deliveries made against "futures" contract.

(2) CONSTITUTION AND CAPITAL.

Most of the trading associations are private companies with limited liability operating on a profit sharing basis under the Indian

*At least one association in the United Provinces, viz., the Krishna Beopar Mandal, Ghaziabad, handles "futures" transactions in *ghat*.

Companies Act, 1913, Section 13*. A comparatively few only are registered under Section 26 of the Act which applies to companies operating on a non-profit sharing basis. Notable in the latter category is the Chamber of Commerce, Hapur† and in the former the Amritsar Produce Exchange, Ltd., and the Sham Sundar Trading Co., Ltd., Lyallpur.

The share capital of these various institutions varies considerably. One small association in the Punjab at Dhuri (Patiala State) has a capital of Rs. 25,000 divided into 50 shares of Rs. 500 each. Another at Fazilka has a capital of Rs. 20,000 while the Amritsar Produce Exchange, Ltd., and the Traders Guarantee Trust Co., Ltd., also in Amritsar, each have a share capital of Rs. 5,00,000 constituted of 500 shares nominally worth Rs. 1,000 each.

(3) OBJECTS AND METHODS OF BUSINESS.

The main objects of the associations registered under Section 13 as set forth in their Memoranda and Articles of Association may be summarised as follows :—

- (a) to carry on the business of banking, warehousing, merchants and commission agents in any article or commodity,
- (b) to buy, acquire and deal with the business assets and liabilities of any company or firm, person or persons, carrying on any business,
- (c) to erect, construct or repair buildings for the purpose of carrying on the business of the Company,
- (d) to draw, accept and negotiate bills of exchange, promissory notes and other negotiable instruments, to borrow money on promissory notes and take loans from other companies and to lend or invest money of the Company, and
- (e) to enter into arrangements for sharing of profits.

* (1) The Public Companies are Joint Stock Companies or Limited Liability Companies which are formed of seven persons or more. Their individual shares are publicly saleable at any time without the consent of the other shareholders. They have also to file annually with the Registrar, Joint Stock Companies, a statement in the form of a duly audited balance sheet giving particulars which will disclose the general nature of the assets and liabilities of the Company. They have also to conform to various other rules and regulations of the Act.

(2) The Private Companies, as defined by Section 2 (13) of the Indian Companies Act, 1913, are associations of two or more persons formed by private arrangements among themselves for the purpose of carrying on any business or trade. The number of shareholders cannot exceed 50. Each member shares the profits and losses as may be agreed upon according to the amount of capital or personal ability which he individually puts into the business. The shares are not advertised for sale among the public and it is not necessary to file the balance sheet annually with the Registrar as is the case with Public Companies.

†It is understood that the Hapur Chamber of Commerce has recently applied to be reconstituted under Section 13 of the Act, as a Public Company.

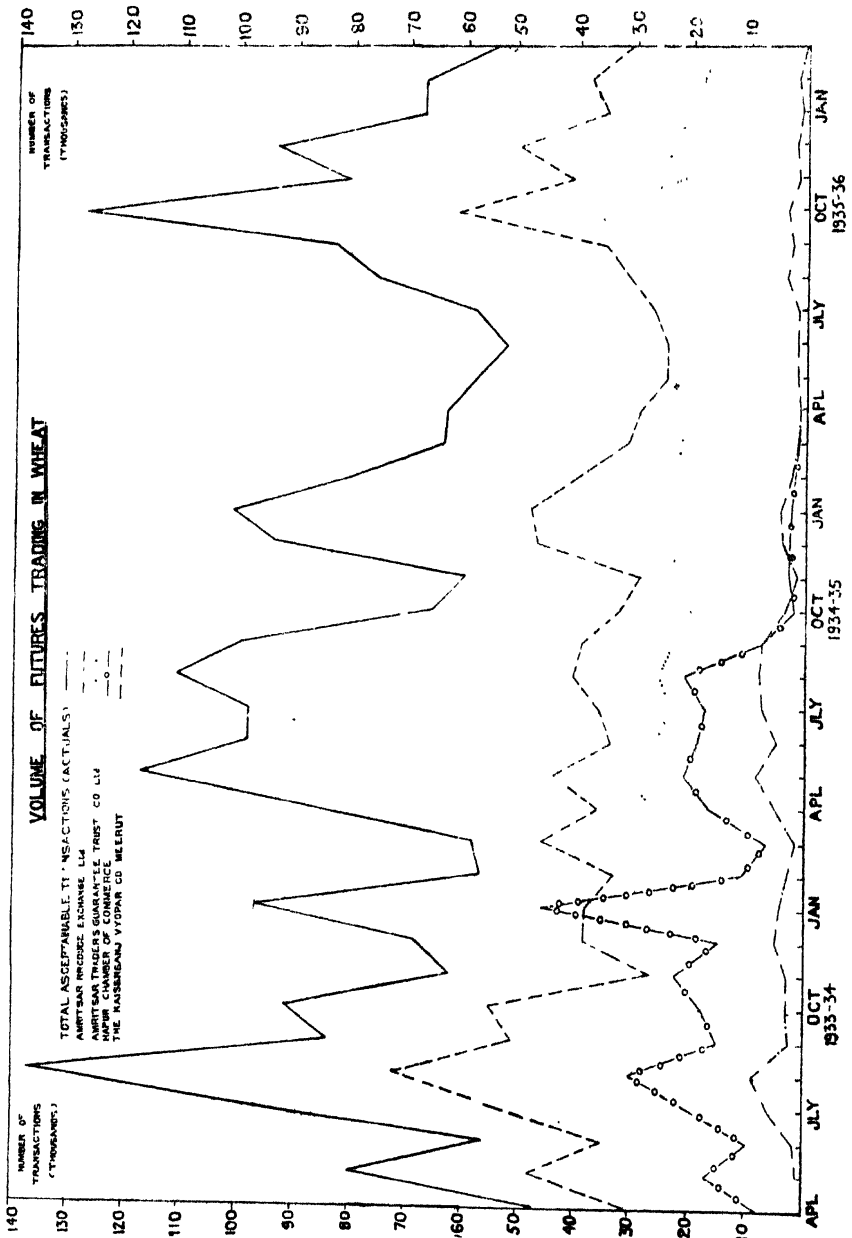
The objects of the comparatively few associations registered under Section 26 of the Indian Companies Act, 1913, are somewhat different. The establishment of uniformity in rules, regulations and trade usages and the provision of facilities for arbitration in disputes and the promotion of trade and commerce are among the general aims and objects of the institutions registered under this section of the Act. In contradistinction to the profit-sharing associations first mentioned it is laid down that the income and property of the latter type of association shall not be paid or transferred directly or indirectly by way of dividend or bonus as profit to the persons who are, or have been, members of the association. The advance or loan of money on the security of pledged stocks or any form of trading is debarred under this section of the Act.

In actual practice, the buying and selling of wheat on their own or clients account is not undertaken even by the profit-sharing associations and the main function of these associations is to serve as a clearing house for the adjustment of the claims and liabilities of their members to each other in respect of "futures" contracts. In a few instances advances to the extent of about 70 or 75 per cent. of the full value, are made against stocks of wheat pledged to the associations, the procedure followed being similar to that practised by the banks.

The management of the associations registered under Section 13 is vested in a board of directors whose number varies with the different institutions. The Amritsar Produce Exchange, Ltd., has 25 directors, the Traders Guarantee Trust Co., of the same town has 15, including the Chairman, others again have 5, 9 and 12 directors. The Hapur Chamber of Commerce and kindred bodies registered under Section 26 have committees of varying strengths of whom two are respectively President and Vice-President. The Hapur Chamber has seven members in all while the Chamber of Commerce, Chandausi, has 9 members.

The premises occupied by these associations range from a small one or two roomed rented shop identical with those of the average *arhatiya* as at Jaranwala, Ludhiana and Fazilka in the Punjab and Ghaziabad in the United Provinces, to the more pretentious buildings such as those belonging to the Karachi Indian Merchants Association, the Amritsar Produce Exchange, Ltd., or the Hapur Chamber of Commerce all of which were specially constructed from the associations' funds for the housing of its administrative staff. The few large associations have a staff of perhaps anything up to 20 employees and a full time secretary, others are run by a manager and one or two clerks only.

The number of associations providing any real facilities for trading, comparable with conditions enjoyed by members of kindred associations abroad, in Europe or America, for example, by owning and maintaining suitable premises for the convenience of members is very small. In Karachi, the Karachi Indian Merchants Association has lately erected a new building containing a large trading hall



and individual rooms for its members and brokers, but in the recent past, trading in "futures" used to take place in a small public park in the middle of the business quarter of the town and the obstruction caused to pedestrian and vehicular traffic in the neighbourhood during hectic periods of trading used frequently to necessitate intervention by the police. In Amritsar trading in "futures" is conducted in premises set apart for this express purpose. The offices of the Amritsar Produce Exchange, Ltd., are at some little distance from the trading "pit". This "pit" was formerly a disused stable yard in a *cul-de-sac* off one of the main thoroughfares in the city, and consists of a long rectangular enclosure surrounded on three sides by two and three storeyed buildings with rooms opening out on to a narrow verandah or balcony overlooking the enclosure. (See plate facing page 341.) These rooms or stalls, of which there are between 50 and 60, are let out by the Association to its members for a small fee and are equipped with telephones (at the cost of the lessee). The Traders Guarantee Trust Company, Ltd., also has a trading "pit" a few hundred yards away near the market itself. The arrangements are somewhat similar except that the enclosure is shaped in the form of a square and has a raised platform in the centre with an awning of tarpaulin. At all the other up-country markets, notably at Lyallpur, Gojra, Jaranwala, Hapur, etc., no such conveniences for trading exist. Brokers congregate at odd places in the market square, such meetings being spontaneous, or they may move from shop to shop.

Brokers play a large part in the "futures" markets as they are the sole vehicle by which trading is conducted. As a general rule brokers are licensed by the associations and are compelled to deposit some form of security, personal or cash, which varies from Rs. 50 to Rs. 500* at the different exchanges. The rules governing the appointment or recognition of individuals as brokers are, however, observed with considerable laxity at many places. During business hours there is always a considerable number of brokers standing by in the pit or trading ring and the number swells or diminishes hourly according to market conditions but large quantities of "options" can change hands in a few minutes. Bids and offers are shouted out accompanied by gestures of the hand to signify whether buyer or seller.

Hours of trading in "futures" are fixed according to the rules of the association. This does not, however, debar the making of "spot" or "ready" transactions at any time convenient to buyer and seller, but where there is no common meeting place such regulations are impossible to enforce. In practice, therefore, forward trading goes on at any hour of the day or night, and particularly when business is brisk and fluctuations considerable. The normal official hours of trading in "futures" are usually somewhere between 8-30 A.M. and 7 P.M. and each association may have its own times within

*At Hapur a personal security of Rs. 500 is necessary or alternatively a cash deposit of Rs. 250, without interest.

these two extremes. At Bombay, however, the Marwadi Chamber of Commerce sanctions trading during the evening from 8 to 10-30 P.M. ; this is presumably in order to fit in with the close of trading on the Baltic Exchange in London at 4 P.M. The Amritsar Produce Exchange, Ltd., have recently advanced their closing time by one hour to permit of receipt of foreign cables quoting the opening at Chicago.

The great majority of the associations derive their main revenue from a commission or charge which may be based on the unit of transaction or on the value of the produce handled. For example, the Amritsar Produce Exchange, Ltd., acts as principal to principal. All contracts are registered with the Association and a fee of two annas per contract (500 maunds) is charged by the association to cover the cost of administration. Contracts are accompanied by the necessary margin money which in this case is eight annas per bag or Rs. 100 for each 500 maunds. Once the contract is registered in the books of the exchange the parties concerned cease to have anything to do directly with each other and the position of each party regarding its "long" and "short" is kept by the Association. On the due date the rates are fixed according to the prevailing market by a general meeting of the Produce Merchants Association, a governing and separate body, all of whose members are also members of the Amritsar Produce Exchange, Ltd. The outstanding accounts are all liquidated through the Exchange itself. At other associations, as for example, the Karachi Indian Merchants Association, and the port exchanges generally, only delivery orders are issued through the association concerned. No individual contracts are recorded by the association and a fee is charged on each delivery order.

The system of the registration of contracts, as generally practised by the majority of up-country exchanges, may be briefly described as follows. Each certified broker is issued with a book of printed forms by the association. These forms are in triplicate or quadruplicate. As soon as a transaction has been made the brokers concerned make a note of it and whenever convenient the necessary entries are made in the book of forms, each form being countersigned by the parties concerned. The buyer's broker hands one copy to the seller's broker, one goes to the buyer and one is retained. Similarly the seller's broker gives one copy to the buyer's broker and one to the seller. On a certain specified time on the following day all the members of the association who have either bought or sold enter up the details of their contracts on printed forms specially prepared for the purpose by the association. These forms are forwarded to the office of the association accompanied by the brokers' slips. Both are carefully checked by the association and if found correct the transactions are confirmed.

The unit of transaction varies from 125 maunds per contract as at Sonapat (Punjab) to 25 tons at Karachi and Hapur. A 500 maunds unit is in vogue at Amritsar, Lahore and Sargodha. The most common unit is, however, 250 maunds which is reckoned to be equivalent to 100 bags. The 250 maunds unit is found at most

Canal Colony markets where these trading associations exist. At Lyallpur, however, the unit is 270 maunds or 100 bags of roughly 224 lb. net per bag, which is the standard filling in the export trade.

The amount of margin money which is required by the rule of the various associations ranges from eight annas per bag of $2\frac{1}{2}$ maunds to Rs. 1-8-0. The most common rate seems to be eight annas per bag, although a large number of associations also specify a deposit of Re. 1 per bag. All these deposits serve as security against loss to the exchange and a careful check is kept on the difference between the deposits of members and the current market rates. Should it be found that the deposit falls short of the necessary margin, intimation is forwarded to the party concerned to increase the deposit. All sums so deposited bear interest at varying rates based on money market conditions. At Amritsar the rate at present is $4\frac{1}{2}$ per cent per annum.

The particular system of "futures" trading in vogue at Okara in the Punjab seems worthy of comment. The members of the local association are divided into three classes. Those members who are regular traders and of good reputation are regarded as being in the first category and have the privilege of depositing only Rs. 25 per 100 bags. Their accounts are, however, adjusted from day to day at 2 P.M., the rate prevailing at 12 noon being taken as the basis. Those in second class are not required to settle their accounts daily but have to keep a margin with the association of Rs. 50 per 100 bags. Members of the third category are not considered very reliable and are required to deposit a margin of Rs. 125 per 100 bags, the rate which is the standard as laid down in the rules of the Association.

Most of the associations have periodical settlements or adjustments between the rates of outstanding contracts and the current market rate on certain fixed days. In Calcutta, for instance, the closing spot rate of Saturday afternoon is fixed by the committee of the Calcutta Wheat and Seeds Association at 4 P.M. and this rate forms the basis for a weekly cash adjustment of "differences".

The months of delivery against "futures" contracts are discussed in more detail in another part of this report. It may be sufficient to mention here that each association has its own delivery months without regard to uniformity of practice in other markets. In Calcutta only two positions are traded in, *viz.*, May and September. In Bombay there are three delivery months, the first in May followed by September and January. At the other end of the scale Karachi has as many as eight delivery months, *viz.*, May, July, September, October, November, December, January and March. The up-country associations usually have four or five delivery months only. At the ports the delivery months are quoted on the European Calendar, while in the interior markets the *Vikrami* calendar is in vogue both for the purposes of quotations and deliveries.

All the exchanges have fixed option periods during the delivery months during which delivery may be tendered or demanded. In the up-country markets this is usually during the last fortnight preceding the due date. Notices from buyers demanding delivery are known as "Demand Orders" and those from sellers offering delivery "Delivery Orders". The rules governing the settlement dates and submission of tenders at some of the more important markets are shown in Appendix L.

(4) VOLUME AND PERIODICITY OF TRADING.

Owing to the essential difference between the two methods of dealing with "futures" transactions it has been found impossible to ascertain exactly how much wheat is traded in the "futures" markets of the country. Where an association or exchange derives its main revenues from a certain charge per contract or per lbs. 10J worth of produce handled it has been found possible to collect very precise data. At other associations, as for example, in Karachi, Bombay and Calcutta where a fee is charged on delivery orders only and the individual contracts are not registered by the association, it has unfortunately not been possible to obtain an exact idea of the total volume of trading. At those associations in which each contract is registered and regarding whose operation detailed information is available, as for example, at Amritsar, Lahore, Lyallpur and the majority of the up-country exchanges, 20.6 million tons of wheat were bought and sold during 1935-36 at 24 associations. In the previous year the total was 22.8 million tons for 27 exchanges. No account has been taken of those associations for which no data were available and these constitute almost half of the total number of associations known to be in existence at the present time. At a conservative estimate, therefore, and allowing for the fact that the major associations have already been included, it may be reckoned that at least another 10 million tons are annually traded at these other institutions, making a total of about 31 million tons in all during 1935-36. To this figure must be added the volume of trading which takes place at Karachi, Bombay and Calcutta. Unfortunately, the actual number of transactions are unavailable but the total quantity of wheat delivered against "futures" contracts are known. During 1934-35 and 1935-36 over 38,000 and nearly 49,000 tons of wheat were delivered respectively against "futures" contracts in Karachi and about 42,000 tons in Bombay during 1934-35 (Appendix XLVII). Taking the ratio of deliveries to the total volume of trading as .25 per cent. at Karachi and .5 per cent. at Bombay, proportions verified by estimates obtained on the spot and supported by the actual evidence obtained from a large number of associations in Northern India, it may be estimated that about 15 million tons represent the total volume of trading in wheat at Karachi, and about 8 million tons at Bombay. No records of actual transactions are kept by the Calcutta Grain, Rice and Seeds Association other than the actual deliveries in settlement of "futures" contracts. Although these were only 360 tons in 1935 and 2,510 tons in 1936 local estimates seemed to place the annual volume of trading in the neighbourhood of 3 million tons.

The total volume of "futures" trading in India during 1934-35 and 1935-36 may, therefore, be estimated at approximately 59 and 60 million tons made up as follows :—

Volume of "futures" trading in India.

			1934-35. Tons.	19 35- 36. Tons.
17 Associations (actual)	..	..	18,456,395	16,036,936
10 Associations (actual)	..	..	4,324,035	..
7 Associations (actual)	..	..	..	4,545,464
40 Associations (estimated)	..	..	10,000,000	10,000,000
Karachi (estimated)	..	..	15,000,000	30,000,000*
Bombay (estimated)	..	..	8,000,000	
Calcutta (estimated)	..	..	3,000,000	
Total	..	..	58,780,430	60,582,400

It is interesting to compare the volume of "futures" trading in India with that of the United States of America where in 12 out of the 15 exchanges, designated as contract markets under the Grain Futures Act, the total volume of "futures" trading in wheat during the financial year ending 30th June 1935, amounted to 8,096,503,000 bushels or roughly 13 times more than the last 5 years' average wheat crop of that country. Comparison with India is interesting and indicates that on the above showing the probable volume of "futures" trading in this country is only about $6\frac{1}{2}$ times more than the average crop (9.5 million tons).

It is also of interest to compare the percentage of "futures" contracts settled by actual delivery. In the United States the percentage of deliveries to total sales was .26 in July 1934, .34 in September, .50 in December and .52 in May 1935. In India, on the other hand, the percentage of deliveries against "futures" contracts varies considerably. In the Amritsar Produce Exchange, Ltd., .5 per cent of the total sales both in 1934-35 and 1935-36 was settled by delivery. In 1933-34 the proportion was .6 per cent. On the other hand the Traders Guarantee Trust Co., Ltd., also at Amritsar, showed a high volume of trading, an average of about 5.25 million tons during 1934-35 and 1935-36, but the average total deliveries were only about 4,500 tons or considerably less than one-tenth of 1 per cent. It would appear, therefore, that the operations registered in the first exchange are less speculative than those conducted under the auspices of the latter exchange. The only other up-country exchange comparable with the two associations at Amritsar is that at Hapur, although the actual deliveries are unascertainable, but since the total numbers of *khattis* filled with wheat at this market are known, most of which are tendered against "futures" contracts, it is possible to arrive at a fairly close estimate as to the proportion of likely deliveries to the total volume of "futures" sales. The ratio works out to about the

*Estimated on basis of quantities known to be actually delivered.

same as at Amritsar Produce Exchange, Ltd., *viz.*, about .5 per cent. The proportion actually delivered, however, is higher in the large surplus producing areas of the Punjab, as for example at Lyallpur, Toba Tek Singh, Jaranwala, Arifwala, where anything between 2.46 and 4.28 per cent of "futures" contracts are settled by delivery, than in those markets which are situated away from the surplus wheat zones. Of the latter Amritsar and Calcutta are typical examples. Calcutta is notable for the highly speculative nature of its jute market and the effect which this market has on other exchanges in that city is often considerable and is reflected in the extremely low proportion of actual deliveries in settlement of "futures" contracts—probably lower than at any other exchange in India. Others again are Jullundur where deliveries are only .1 per cent of the total volume of trading, Moga where the proportion is almost infinitesimal, and other markets such as Muktesar, Bhatinda, etc. The percentage of deliveries at Chandausi and Ghaziabad in the United Provinces also resemble conditions in the great surplus areas in the Punjab. At Chandausi the proportion of deliveries has been steadily increasing since 1933-34 and was as high as 4.49 per cent in 1935-36, but the volume of "futures" trading appears to have decreased compared to what it was in 1933-34. Figures are available only for 1934-35 for one of the associations at Ghaziabad and the proportion is 1.87 per cent. Bareilly shows a fair turnover of nearly 291,210 tons of which roughly .4 per cent, or 1,160 tons were delivered in settlement.

The actual quantity of wheat delivered in settlement of "futures" contracts at 20 associations in 1934-35 was 145,860 tons which equals about .33 per cent of the total volume of "future" trading on those exchanges. In 1935-36 the ratio was slightly higher, *i.e.*, about .40 per cent, statistics showing actual deliveries of wheat at 63,416 tons on 11 exchanges out of a total turnover of 14,629,230 tons. The greatest quantities delivered were at Amritsar, Karachi and Bombay.

The total amount of wheat so delivered at all the associations in India cannot be ascertained with accuracy but it is probably safe to assume from the evidence so far recorded that 200,000 tons in any average year would not be an over-statement.

It will be observed from Appendices XLVII and XLIX that the volume of "futures" trading has in most cases diminished, sometimes considerably, between 1933-34 and 1935-36. In the Punjab, for instance, transactions at one association in Amritsar fell from 9.7 to 7.8 million tons during this period. In 1935-36 the associations at Jullundur and Moga registered roughly one-third and one-half of their turnover for 1933-34. Substantial decreases also occurred in the United Provinces, *e.g.*, at Muzaffarnagar, Deoband and at other markets. A few isolated cases of significant increases are those of Bhatinda* in the Punjab, where the turnover between 1934-35 and 1935-36 was nearly doubled, and at Barnala in

*Patiala State.

the same province where the volume of "futures" trading expanded more than five and a half times in the same period.

It is significant that the general decrease in the volume of "futures" trading shown in the table on page 277, i.e., from 18.5 million to 16.0 million tons, for a comparable number of associations, has coincided with a period of relative stagnation both in regard to price variations and the export trade, but there is every reason to believe that in the last few months of 1936 the volume of "futures" trading showed a phenomenal increase owing to the resumption of the export trade and also in a large measure to the buoyant tendency in foreign markets and the steady rise in the Indian price level. There seems little doubt that during the period 1931-33 the above figures have been greatly exceeded and it is also apparent that the volume of trading in 1936-37 will also be in excess of the 1934-35 and 1935-36 totals.

The months in which "futures" trading is brisk and the periods when activity is less are clearly shown in the diagram on page 272. The data on which this diagram is based are given in Appendix XLIX. On the whole, August, September and October are months in which trading is particularly active. These as "weather" months, for it is upon the seasonal rains that the success or failure of both *kharif* and *rabi* crops depends. The market therefore reacts very sharply to new crop prospects, and moreover it is a period during which the "switching" forward of September transactions which were made during the harvest period is very commonly done. There is no very definite periodicity in the periods during which trading is slack. In 1933-34 the volume of "futures" trading was at its lowest in April 1933 and February 1934. In the following year November and March showed the least activity while in 1935-36 June and March were the low points. It is significant that the volume of "futures" trading in the four associations whose transactions are illustrated in the diagram on page 272 follows a sympathetic trend in each case with only minor deviations. For example, the movement of the curves representing the Amritsar Produce Exchange, Ltd., and the Amritsar Traders Gurrantee Trust (Co., Ltd.), is strikingly similar. This is also noticeable in the periodicity of the volume of trading between Hapur and Amritsar.

No legislation exists in India for the purpose of controlling transactions on grain "futures" exchanges, although the Bombay Cotton Contracts Act, 1932, purports to regulate transactions on the Cotton Exchange in Bombay. It is interesting to observe that at Ghaziabad in the United Provinces the local association has fixed a limit to the number of transactions which may stand in the name of one party at any one time. A measure of this type does not appear to be in existence at other grain trade associations or exchanges. Legislation has, however, been in force for 12 years in the United States and a bill to amend the Grain Futures Act in the light of past experience was passed in June 1935. The Bill was made law by the Commodity Exchange Act in September 1936 and establishes limitations on the speculative transactions of individual operators in grain "futures"

and in cotton, mill feed, butter, egg and rice "futures" for the purpose of eliminating the burden of excessive speculation. "Hedging" transactions are exempted from trading limitations. "Futures" commission agents and brokers executing "futures" transactions are required under the pending bill to register annually with the Secretary of Agriculture. Certain practices which lend themselves to the cheating of customers or the manipulation of grain prices would be outlawed under the proposed legislation. It is claimed that the enactment of this law to reinforce the Grain Futures Act will result in substantial benefit to all those using the "futures" exchanges for legitimate economic purposes.

E.—Note on retail distribution and price margins.

In the villages the retailer of wheat almost invariably handles other food grains and pulses and is also a purveyor of general household stores, spices and oils (both mineral and vegetable) and occasionally cigarettes (*bidis*), etc. He is in fact almost the prototype of the small village grocer or general dealer in any European country. In the villages the *baniya* is more often than not the chief retailer. He obtains his wheat directly from the cultivator, occasionally by cash purchase or more frequently as repayment in kind against cash loans or advances of grain for seed or domestic use.

The town retailer handles the same range of articles as his village prototype and sometimes operates a *chakki* or power driven stone mill. He obtains his stock-in-trade from *pakka arhatiyas* in the same town and occasionally through *kachcha arhatiyas* from village-sellers in the open market. Such purchases are usually paid for within a fortnight from the date of the transaction, free of interest. Retail sales are mostly for cash, but one month's credit is often allowed to those customers who are known to be in permanent employment or in salaried posts.

The town retailer's business is less personal than that of his country confrere who is known to everybody in the village and has a social position of some importance in the rural community. The town retailer on the other hand is not infrequently a "foreigner" in the sense that he may hail from some other province, and his influence on the economic and domestic life of his customers is negligible, for, as a rule, he lends no money nor does he participate in financing the trade. In Delhi, for instance, many of the retailers come from Rajputana and the Punjab. In Calcutta the greater number of retailers are not Bengalees, as might be expected, but persons from the United Provinces and Bihar.

Only a few instances occur in which a cultivator retails wheat direct to the consumer. No records of sales are kept by retailers and the amount or proportion of wheat sold retail cannot be gauged accurately owing to the enormous number of retailers in the country, and to the fact that wholesalers may also participate in retail distribution. Enquiries in various parts of the country would indicate that roughly 70 to 75 per cent. of the total amount of wheat actually

marketed in India is retailed in both rural and urban areas. The retail trade of a town or village is not necessarily concentrated in any special localities or in any particular markets but it has been observed that in all the larger country towns the retail shops tend to concentrate near the wholesale market and also in the most densely populated quarters, exactly as in the great cities. In the smaller villages there are only one or at the most two shops owned by the local *baniyas* whose functions have been fully described elsewhere in this report. There appear to be no retail trade associations in India and the urban consumers' co-operative movement is relatively undeveloped (*see* page 315).

Prices are nowhere displayed or marked on the goods offered for sale. Transactions are sometimes effected after bargaining—a process which may take a considerable time. Prices are, therefore, seldom fixed, and the same grade or type of grain may during the course of the day fetch a series of different values depending on the bargaining capacity and social status of the customers.

Retail margins.—The difference between the price paid by the retailer to the *pakka arhatiya* or wholesaler for his stock-in-trade and the price he realises from his customer constitutes the retailer's margin. To arrive at the net margin the cost of transporting the wheat from the wholesale market or the *arhatiya's* premises to the retailer's shop should be deducted. This charge is ordinarily 3 to 6 pies per maund depending on the distance separating the retailer's premises from the wholesale market and the cost of dressing, cleaning and sieving has been found to average 6 pies per maund.

For reasons already stated wholesale and retail price margins vary not only in the same market but from place to place and from season to season. The following examples show the range and extent of these variations.

In the *Punjab* the differences between the official fortnightly wholesale and retail quotations of white wheat at six important centres are shown in the following table :—

Difference between wholesale and retail prices (per maund) of wheat.

	Ambala.	Jullundur.	Lahore	Amritsar.	Rawal pindi.	Lyalpur.
	Rs a. p.	Rs a. p.	Rs. a p.	Rs. a. p.	Rs a. p.	Rs. a. p.
1930.						
Maximum difference ..	0 3 8	0 6 1	0 3 4	0 5 3	0 7 0	0 11 0
Minimum ..	0 0 11	0 0 1	0 0 9	.	0 0 3	0 0 8
Average ..	0 1 9	0 1 11	0 1 9	0 2 5	0 2 6	0 4 4
1931.						
Maximum difference ..	0 2 1	0 4 8	0 2 6	0 2 1	0 3 6	0 4 8
Minimum ..	0 0 8	0 0 1	0 0 1	..	0 0 4	0 0 2
Average ..	0 0 10	0 1 4	0 1 6	0 1 10	0 1 10	0 1 11

		Ambala.	Jullundur.	Lahore.	Amritsar.	Rawal-pindi.	Lyallpur.
		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
1932.							
Maximum difference	..	0 2 8	0 5 5	0 4 5	0 2 2	0 7 8	0 2 9
Minimum	..	0 0 8	0 0 9	0 1 3	..	..	0 0 1
Average	..	0 1 4	0 1 9	0 2 1	0 0 7	0 3 0	0 1 4
1933.							
Maximum difference	..	0 1 11	0 3 8	0 2 5	0 2 2	0 5 4	0 3 0
Minimum	..	..	0 0 3	0 0 5	..	..	0 0 2
Average	..	0 1 4	0 1 8	0 1 6	0 0 11	0 1 8	0 1 6
1934.							
Maximum difference	..	0 2 1	0 5 1	0 2 3	0 4 0	0 1 8	0 4 8
Minimum	..	..	..	0 0 3	..	..	0 0 1
Average	..	0 0 11	0 2 8	0 0 11	0 1 9	0 0 7	0 1 10

The lowest average difference was Re. 0-0-7 per maund at Amritsar in 1932 and the maximum was Re. 0-4-4 at Lyallpur in 1930. The average difference for each of the years from 1930 to 1934 was Re. 0-2-5, Re. 0-1-7, Re. 0-1-10, Re. 0-1-5 and Re. 0-1-6 successively.

In *Delhi* the average annual margins between wholesale and retail prices of fair average quality white wheat was Re. 0-4-6 per maund in 1931, Re. 0-3-2 in 1932, Re. 0-3-3 in 1933 and Re. 0-2-7 in 1934. Those for good red wheat ranged from Re. 0-1-9 to Re. 0-2-6 per maund during the same period.

In the *Central Provinces* the gross margins between the official wholesale and retail prices of wheat at Jubbulpore and Nagpur during 1933 to 1935 are shown in the following table :—

Difference between the wholesale and retail prices of wheat.
(Annas per maund.)

		1933.		1934.		1935.	
		Jubbulpur.	Nagpur.	Jubbulpur.	Nagpur.	Jubbulpur.	Nagpur
January	..	3	3	3	2	4	1
February	..	3	3	4	3	3	2
March	..	3	5	2	4	2	3
April	..	3	4	2	3	2	3
May	..	4	4	1	2	3	2
June	..	3	3	3	3	3	2
July	..	4	3	3	2	3	2
August	..	2	3	3	5	3	3
September	..	3	6	6	2	2	2
October	..	3	6	4	2	3	3
November	..	3	4	4	3	3	2
December	..	3	3	3	2	3	2

Retail margins on certain dates obtained by enquiries from the trade itself were as follows :—

Retail margins of wheat.

(Annas per maund.)

Date.	Jubbulpore.	Saugor.	Khandwa.
20th July 1935	3	2	2
17th August 1935	2	3	4
14th September 1935	1	3	2
19th September 1935 .. .. .	..	2	2
23rd November 1935	3	6	2
28th December 1935	3	3	1

Differences between wholesale and retail prices at Saugor during the period 1931 to 1935 ranged from 1 anna per maund in July, September and October in the first year to 6 annas in October 1932 and 1933 and 8 annas in October 1935. On the majority of occasions, however, these differences fluctuated between 2 and 4 annas.

In the *Bombay* Presidency the official price data proved to be so unreliable as to necessitate the recording of a large number of personal observations as to the actual margins. The following are some typical examples relating to *durum* wheat which is the predominating type grown in Bombay. At Sholapur during August 1936 Bijapur red was being retailed at Re. 0-1-3 to Re. 0-2-3 per maund above the wholesale price, and *khandwa* (amber *durum*) at Re. 0-4-5 higher. During the same month at Bijapur the first and second grades of the local red wheat retailed respectively at Re. 0-2-0 and Re. 0-0-11 per maund dearer than the wholesale equivalents on the same days. In August at Hubli wholesale-retail differences for the first and second grades of the local wheat were Re. 0-4-7 and Re. 0-3-8 per maund respectively, the corresponding qualities of white wheats retailing at Re. 0-4-1 and Re. 0-2-5 more about the same period. At Dharwar the best red *durum* was selling at Re. 0-4-9 per maund over wholesale, the second quality at Re. 0-1-11 and the third at Re. 0-0-9, while the best white wheat of the locality retailed at a premium of Re. 0-5-1, the second grade at Re. 0-3-6 and the third at Re. 0-2-2 per maund. In Belgaum the wholesale-retail differences were Re. 0-2-0 and Re. 0-1-0 per maund for the best and second best red wheat and Re. 0-2-5 for white. In Bombay city itself white Punjab *sharbati* wheat (*T. vulgare*) was retailing at about Re. 0-5-6 per maund above the wholesale price of the day.

The wholesale-retail price differences shown below in Hyderabad (Deccan) for *bansi* wheat, a high grade *durum*, were found to be wider than in any other part of India :—

						<i>Per maund.</i>		
						1934.	1935.	
						Rs. a. p.	Rs. a. p.	
January	..	..	..	..	..	0 9 3	0 12 3	
February	..	..	..	..	..	0 13 3	0 12 0	
March	..	..	..	..	..	0 7 9	1 1 5	
April	..	..	..	..	..	0 4 7	0 14 3	
May	..	..	..	..	..	0 8 6	0 15 7	
June	..	..	..	..	..	0 9 7	0 15 6	
July	..	..	..	..	..	0 12 1	0 15 10	
August	..	..	..	..	..	0 4 8	0 15 2	
September	..	..	..	..	..	0 6 11	1 1 4	
October	..	..	..	..	..	0 7 9	1 3 0	
November	..	..	..	..	..	0 12 2	0 14 5	
December	..	..	..	..	..	0 12 7	0 13 10	

At Cochin, in south India, retailers' margins on various dates from 19th June 1933 to 4th January 1936 showed fair consistency in the neighbourhood of 6 to 7½ annas per maund. The maximum margin observed was that of 19th December 1933 when it was Re. 0-11-11 per maund.

The average margins in certain important areas, expressed in percentage, are shown in the following table :—

Year.				Punjab.*	Delhi.	U. P.†	C. P.‡	Bombay.§	Cochin.
				%	%	%	%	%	%
1931	..	..	..	4.7	4.10	3.9	8.1	..	..
1932	..	..	..	2.5	4.81	4.81	4.8	..	..
1933	..	..	..	4.9	5.70	4.7	8.5	..	9.9
1934	..	..	..	4.8	5.48	3.5	6.5	..	9.2
1935	..	..	..	2.9	..	3.8	6.2	8.8	9.5
Average	..	..	..	3.9	5.0	4.1	6.8	8.8	9.5

* Punjab.—Average of six markets—Lyallpur, Amritsar, Lahore, Rawalpindi, Jullundur and Ambala.

† United Provinces.—Cawnpore.

‡ Central Provinces.—Nagpur and Jabulpore.

§ Bombay.—Average of seven markets—Ahmedabad, Surat, Poona, Sholapur, Bijapur, Ahmadnagar and Hubli.

The data given show that retail price margins tend to widen as the distance from the surplus areas grows greater. In the Punjab margins are relatively low but they rise in Delhi, a deficit area, fall again in the United Provinces, rise again in the Central Provinces and Bombay, and particularly in Cochin a market typifying conditions in the extreme south of India where there is a special outlet for *durum* wheat. At Cochin, as in Hyderabad, wholesale and retail prices differ by a greater extent than in any of the markets of Northern or Central India.

INTER-CHAPTER NINE.

The *pakka arhatiya* is the pivot of the whole system of distribution. The *pakka arhatiya* in the assembling market sells to his opposite number in the distributing market. In addition to purely trading activities they function in many cases as bankers (*shroffs*). Much of their business is financed by means of *hundis*, which may be either drafts payable on demand (*darshani*), or more generally payable within a fixed period (*mudatti*). The *pakka arhatiya* firms usually deal also in other articles apart from grain, *e.g.*, oilseeds, sugar, etc., which they may purchase by way of return trade.

As compared with *shroffs*, modern joint-stock banks play a limited part in financing the distribution of wheat mainly owing to the fact that they are not represented and cannot function in regard to remittances in the smaller towns and larger villages, *e.g.*, although there are over 2,500 towns in India with a population of 5,000 or more, bank branches exist in less than 830 of them.

In the grain export trade two or three large firms of international repute are the main operators. Some of these have employees acting as agents in the up-country stations. More recently, however, many of these up-country agencies have been closed. Their presence was useful in so far as the daily buying rates given to the agents by their principals tended to keep all the markets in line with one another and with the prices in the port exchanges. Their place has not since been adequately filled by any other corresponding agency engaged in the internal trade.

The business of the *pakka arhatiya* is based very much on personal relations with certain other *pakka arhatiyas* who are acquainted with the market practices and charges prevailing in their district. There

is need for these firms to enlarge the scope of their operations and this would be greatly facilitated by the regulation of market practices and the standardisation of market charges throughout the country. They could then send produce with greater confidence to merchants in new and more distant markets.

Producers' co-operatives play an insignificant part in the distribution of wheat. At most, they function as *kachcha arhatiyas* in the locality where the society exists. There is no machinery whereby the local producers' co-operative societies could sell their produce in distant markets. There are few consumers' co-operative societies in the towns to which they might be linked up. They cannot act as *shroffs* like the *pakka arhatiya's* firms and the absence or rudimentary nature of joint-stock banking facilities in out-of-the-way places makes it impossible to rely on them always as collecting agencies against railway receipts. If producers trading societies are ever to expand beyond the embryo stage it is essential that their sponsors should develop marketing machinery corresponding to the *pakka arhatiya* or else engage the *pakka arhatiya* or some other large firms having connections throughout the country to act as selling agents on behalf of the societies. It would seem feasible at least to make an experiment in employing some responsible firm or firms as sole agents for the sale of the produce of these local co-operative societies and the experiment seems worth trying. The linking up of producers' societies with consumers' urban stores might also be considered.

It is very difficult to generalise in regard to the costs of wholesale distribution. These vary from place to place and from one merchant to another. Railway freight, as already mentioned, constitutes a large proportion of the intermediate charges and varies in amount according to the distance from the producing centres of the market concerned. The other charges—excluding

railway freight—also vary considerably and it is impossible to state an average figure which has any real meaning. For example, in some cases the total cost of distribution—apart from railway freight—may be barely $4\frac{1}{2}$ per cent. of the prime cost and in other cases as much as $18\frac{1}{2}$ per cent. The number of charges made against both buyer and seller and also the amount under each heading varies. It is doubtful whether any justification exists for some of those charges. *Bardana* in the form of an allowance to cover differences between new and second hand bags appears to be made irrespective of the condition of the bags concerned. The whole system of charging for bags apparently needs to be put on a proper basis. Commission may or may not be charged where *dami* is included, but there ought to be some rule about this and deductions for charities should not be made except with agreement of the seller and unless they are subsequently paid over to the charitable body concerned. It is highly desirable that the number of recognised charges should be defined and also the approximate amount of each charge.

Some of the expenses are charged to the account of the seller and others against the buyer who, along with the final consumer, ostensibly bears his share of these numerous charges. In actual fact this is a polite fiction so far as wheat in India is concerned. The price paid by the consumer of the Indian wheat is strictly competitive. Not only has the cultivator's wheat to compete with the world price of other wheats at the ports but, in different districts within the country it must compete with rice, barley, gram, *juar* and other substitute food grains. The upper limit of prices is therefore definitely fixed. All the octroi duties, terminal taxes, tolls, market charges and charities paid on the wheat between the cultivator and the consumer, are inevitably forced back on to the cultivator who is willy-nilly compelled to pay for the upkeep of municipal roads and other amenities of the town through octroi

and similar duties. He also pays, by way of charities, in many cases for educating the urban children and for maintaining other charitable institutions from which he himself derives no direct benefit. He pays everybody's interest and carries all the risks of marketing by way of a reduced price for his produce. All those who have any control over those charges and have the interest of the cultivator at heart should use their influence in having these charges reduced or eliminated. In the absence of action of this kind expressions of interest in the welfare of the cultivator may be regarded with scepticism.

Traders themselves through organised associations can do a great deal to reduce the number of these charges and standardise the others. Municipal and local authorities also have a responsibility in the matter but failing action by those parties in the immediate future local Governments will, no doubt, consider what steps should be taken to institute the necessary measures.

Grain trade associations operating produce exchanges at the ports and in the larger markets upcountry play an important part in distribution. They are particularly useful in providing facilities for dealing in "futures". Altogether it is estimated that about 60 million tons were traded in at those exchanges during the year 1935-36 of which between $\frac{1}{3}$ and $\frac{2}{5}$ per cent represents the actual deliveries on "futures" contracts. It seems clear that there is at present an excessive number of such bodies. There are, for example, at least 41 in the Punjab alone and 20 in the United Provinces. The history of these associations does not inspire confidence. For instance out of 61 such institutions registered in the Punjab during 1932-33 only half of them were able to survive even a season's working and many were either moribund or in liquidation in 1934-35.

Size and financial stability are essential factors of an association handling trade in "futures" and it is

necessary that the basis of trading should be as broad as possible in order to bring about conditions likely to promote a large amount of inter-trading between members of different associations and their clients. There seems a tendency at the slightest sign of disagreement for some members of these associations to part company with the parent body and establish competing institutions in the same town. This practice is reprehensible and in order to prevent a constant recurrence it would be advisable that every member should have a very large stake in the association by being required in the first instance to make a heavy deposit which can only be withdrawn with the approval of the managing committee or after fairly long notice and for very good reasons.

The contracts recognised by these various associations differ considerably in character in regard to the basis of tenderable wheat, months of delivery, margins, etc. Before inter-trading can be practised to any real extent it is essential that the contract conditions and other terms of trading should be standardised. A large measure of agreement has already been obtained at a conference of representatives of grain trade associations and milling interests along with the Central Marketing Staff but much yet remains to be done in order to get a standard contract in operation in time for the 1937-38 crop.

As matters stand at present it is not likely that legislation will be required to introduce standard contract terms in the larger and more important grain exchanges. In order to bring other smaller exchanges into line it may however be necessary for provincial Governments and State Durbars to take action by giving statutory recognition to the bye-laws, rules, regulations and contract terms of recognised grain associations within their jurisdiction. If and when this is being done it would be desirable to keep the number of recognised associations to, at most, two or three in any province or State.

An all-India federation of the more important grain trade associations in India could probably assist in this direction and afford guidance to the local Governments regarding the exchanges which should be recognised and also the terms of the bye-laws and standard contract to be approved. The usefulness of a federation of this kind would however be largely nullified if it aimed at being comprehensive rather than selective. It should limit its membership only to those associations on whose exchanges all or any of the members of the federation could trade with confidence. Any association with inadequate financial backing or doubtful methods of procedure would have to be rigorously excluded.

Coming to the retail stage it is still more difficult to generalise. Official prices, for what they are worth, would appear to indicate that the normal retail margin in Northern India does not exceed Re. 0|4|0 or Re. 0|5|0 per maund and is frequently even less than this, and a general average would place the retail margin at about 5 per cent. of the selling price. In southern India the margin appears to be higher, *e.g.*, in Cochin it is Re. 0|6|0 to Re. 0|7|0 per maund and in Hyderabad (Deccan) it appears to range from Re. 0|4|8 to as much as Rs. 1|1|5. It is doubtful, however, whether any reliance can be placed on these retail price quotations. In the course of one morning in various retail markets in Delhi a number of buyers, after the usual process of bargaining, obtained 5 seers of *dara* white wheat at prices ranging from Re. 0|6|9 up to Re. 0|8|6, making altogether a range of about 26 per cent in one day between different retailers. The quality on the whole was fairly uniform except for one sample which was badly weevilled and for which Re. 0|8|0 was paid for 5 seers. The total refraction of the remainder did not exceed 2 or 2½ per cent. For this type of wheat on the wholesale market that day the prices between different merchants ranged

from Rs. 2|15|0 per maund up to Rs. 3|5|6 per maund so that the lowest retail price, *viz.*, Rs. 3|6|0 per maund, represented a very low margin over the highest wholesale price. On the other hand the highest retail price, *viz.*, Rs. 4|4|0 per maund (which incidentally was for the poorest quality) represented a margin of Rs. 1|5|0 per maund over the lowest wholesale price.

One fact which would strike a newcomer to India is that the retail prices are never marked on the articles in the same way as in other countries. The first price asked by a retailer is frequently put forward more in the way of a basis for argument rather than as a serious quotation. It is claimed that the instinct for bargaining is so much ingrained in the Indian temperament that it would be depriving both buyer and seller of a great deal of pleasure if this element in every sale were eliminated. It is doubtful however whether in the end either the buyer or seller gains anything and it certainly involves a considerable waste of time.

One would like to see the retailers of one town trying an experiment by forming an association to eliminate this needless process of bargaining by marking clearly on the goods exposed for sale the day's prices which would be strictly adhered to. It seems possible that the members of such an association would attract to their establishments much more business than they lost. Consumers' cooperative stores in urban districts might give a lead in this matter.

At present the cultivator in some cases gets only about Re. 0|9|3 out of each rupee paid by the consumer. There seems no reason why the parties concerned should adopt a defeatist attitude and accept such conditions for all time to come. Unfortunately, however, the position cannot be altered without a greater measure of efficiency being shown by the distributive trade as a whole and a frank and more open distinction being made between legitimate and illegitimate deductions and charges.

CHAPTER X.—PROCESSING AND DISTRIBUTION OF WHEAT PRODUCTS.

A.—Processing.

Until recently wheat was ground into *ata* by the hand stone mill (*chakki*) or by larger *chakkis* driven by bullocks or camels, oil engines and electricity. *Ata* is ground wheat including the bran although the larger particles of the latter are preferably sifted out prior to consumption.

During the present century and particularly in later years the milling industry has developed considerably until there are now 89 modern roller mills in India, using something like one million tons of wheat annually. The roller mills, however, only touch the fringe of the demand for *ata*, their chief product being white flour or *maida* along with a small proportion of semolina (*suji* and *nava*).

(1) *Chakkis* (STONE MILLS).

(a) *Hand chakkis, kharas and water mills*.—The great bulk of the *ata* consumed in India is still produced by the stone mill but the march of progress in recent years has led to a decline, particularly in urban areas, of hand milling and a change over to cheap mechanical power driven stone mills or *chakkis* of which large numbers are concentrated in the cities and towns and in certain rural areas. Enquiries in a number of towns revealed only a few instances in which wheat was hand-ground, and it is apparent that the women folk of the household whose normal duty is to grind the wheat are unwilling to spend a whole hour converting 2 seers (4 lb.) of wheat into *ata*, the average hourly capacity of a small hand mill. The hand *chakki* is, however, still extensively used for wheat grinding in the more remote rural areas. It is, for example, in common use in the Hissar, Rohtak and Gurgaon districts of the south and the south east Punjab.

The bullock or camel driven stone mill (*kharas*) is encountered mainly in the Punjab (plate facing page 62). These mills are largely owned by the village carpenters. The normal grinding fee or charge is 2 seers per maund which is equivalent roughly to 3 annas per maund at the current value of wheat. The capacity of this type of mill depends upon the size of the stones and on the strength of the animals but as a rule they do not grind less than 10 seers of wheat per hour.

(b) *Oil or electric driven chakkis*.—Mechanically operated stone mills may be either driven by electricity or by oil engines. The former (see plate facing page 60) are found in large numbers in cities and large towns where electricity is available* but with the spread of the hydro-electric system in Northern India and particularly in the Punjab and the western United Provinces the number of *chakkis* driven by electric motors is steadily on the rise. There are at

*In certain cities, as for instance in Delhi, the use of oil engines to drive stone mills is forbidden by municipal regulations and only electric power is permitted.

present about 3,000 electrically driven *chakkis* in India as compared with 1,200 five years ago. These are mainly concentrated in the following cities and large towns as the latest available figures for 1936 show :—

Calcutta	506	Delhi	141
Patna	28	Ajmer	52
Allahabad	22	Lahore	78
Cawnpore	209	Karachi	42
Lucknow	43	Ahmedabad	123
Meerut	149	Bombay	445
Moradabad	137	Poona	113
Agra	73		

Practically all these small mills are self-contained units usually grinding for hire not only wheat but gram, maize, pulses, spices, etc., according to the season and customer's requirements. Their normal charge for grinding is about 4 annas per maund but the rate may vary from 2 annas to 8 annas in different parts depending upon the cost of power and on local competition.

(c) *Number and location.*—As far as can be ascertained, not less than 13,000 oil engine driven *chakkis* operate on wheat in India, the majority of which are located in the Punjab and Northern India generally. The location and distribution of these stone mills is given on the map on opposite page, which also shows the location of electrically driven *chakkis* in cities. It is noteworthy that *chakkis* are most concentrated in those districts in which the population is high and which are also in close proximity to the surplus wheat producing areas. Examples of this concentration are to be seen in the districts of Ludhiana, Jullundur, Amritsar, Lahore, Gujranwala and Sialkot in the Punjab, where nearly 1,700, out of the whole provincial total of some 4,800, mechanical power driven *chakkis* of both types are located. Next to the Punjab the highest number of *chakkis* to be found in any one province is about 2,750 in the United Provinces, of which roughly 1,900 are driven by oil engines. In the Bombay Presidency there are apparently in all about 2,200 *chakkis* of which nearly 1,400 are oil engine driven stone mills.

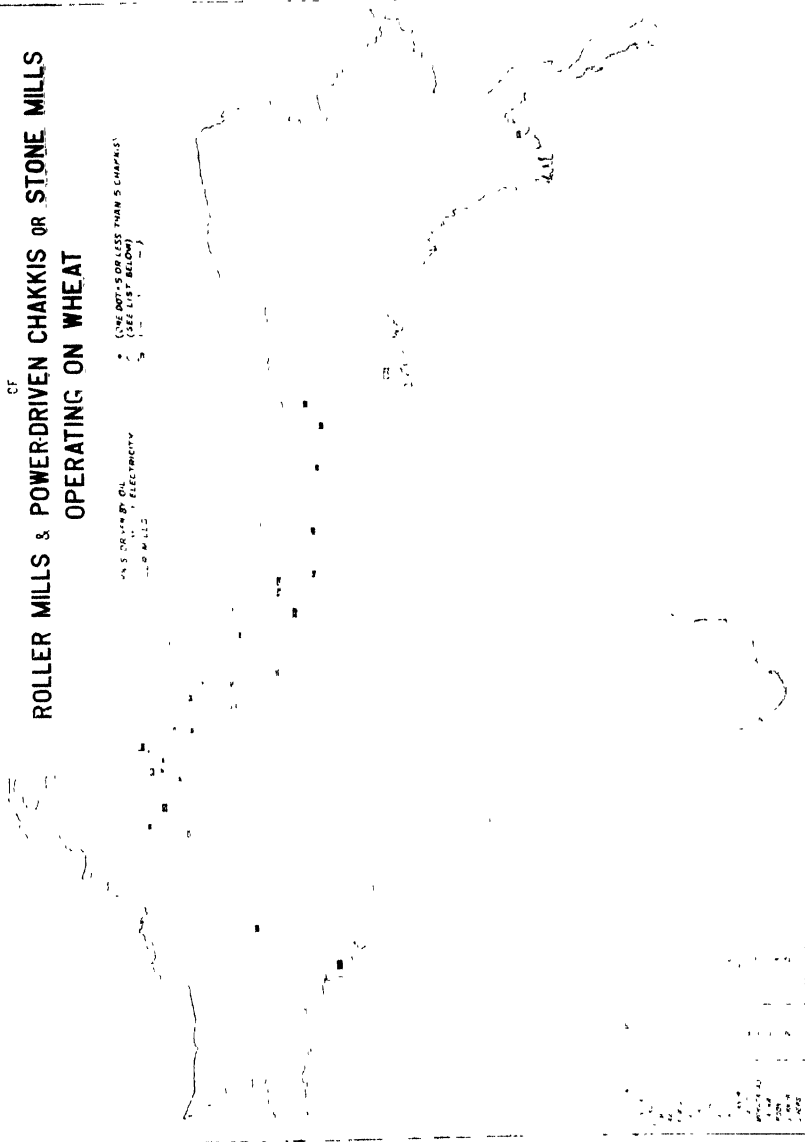
In the Central Provinces there are in all less than 400 *chakkis* of which about 320 are operated by oil engines and only 59 by electricity. In Sind, the total number of *chakkis* is about 650 including some 580 driven by oil engines.

In the Indian States there are well over 3,600 *chakkis* the great majority of which are driven by oil engines. Hyderabad (Deccan) alone has over 1,500 oil engine mills. Other States with fairly large totals being Patiala with 233, Baroda with more than 230, Kapurthala with nearly 170, Bahawalpur with 130, Gwalior with more than 100, Indore with about 80 and the Kathiawar States with about 180.

As far as can be ascertained the total number of power driven *chakkis* handling wheat in India, as will be seen from the following

DISTRIBUTION OF ROLLER MILLS & POWER-DRIVEN CHAKKIS OR STONE MILLS OPERATING ON WHEAT

• ONE DOT = ONE LESS THAN 5 CHAKKIS
 (SEE LIST BELOW)
 • ONE DOT = ONE MILL
 ELECTRICITY
 • ONE DOT = ONE MILL





A RETAIL PURCHASER HAVING HIS WHEAT DRESSED PRIOR
TO GRINDING (*Chulli* in the right background)



PREPARING CHAPATIS IN A BAZAAR FOODSHOP.

table, is more than 15,500 including about 3,000 electrically operated mills to which reference has already been made. Their estimated annual consumption of wheat is shown below :—

Approximate quantity of wheat consumed by small power chakkis.

Provinces and States.	Oil engines.	Electric.	Total.	Average annual consumption per <i>chakki</i> (estimated).	Total quantity crushed (estimated).
				Tons.	Tons.
Punjab (including N. W. F. P. and Baluchistan) ..	4,728	162	4,890	190	929,000
United Provinces.. ..	1,874	875	2,749	180	495,000
Delhi	19	141	160	190	30,000
Sind	576	58	634	100	63,000
Bombay	1,378	837	2,215	90	199,000
Bengal	9	571	580	100	58,000
Central Provinces ..	316	59	375	160	60,000
Bihar and Orissa ..	98	75	173	150	26,000
Madras	37	69	106	15	16,000
Ajmer	63	52	115	170	20,000
Hyderabad	1,513	..	1,513	40	61,000
Central India, Rajputana, Kathiawar, Kutch and miscellaneous ..	2,038	32	2,070	100	207,000
Total* ..	12,649	2,931	15,580	1,615	2,164,000

Oil engine driven *chakkis*, grinding wheat, may be worked in conjunction with a cotton ginnery or a rice huller and are not necessarily self-contained units. This is done mainly to derive the fullest possible benefit from the available power and to reduce the incidence of overhead charges. As already mentioned these small power mills, including the electrically driven ones, mostly work for custom or hire although their operators at places, particularly in the cities and larger towns, may purchase wheat on their own account for grinding and subsequent sale *as ata*.

*The above table excludes 59 oil engine *chakkis* in Portuguese India.

There are a large number of *chakkis* deriving their power direct from the numerous water falls on the canal systems, particularly in Northern India where irrigation works are on a large scale. Natural falls are also taken advantage of in hilly tracts. These *chakkis*, many of which consist of a number of sets of grinding stones, are mostly to be found in the Punjab, the United Provinces and the State of Kashmir, and are variously known in the vernacular as *pan-chakkis*, *ghrats* or *jandars*. In the Punjab there are over 70 known mills of this type operating more than 520 grinding stones, the capacity of which is estimated by the provincial marketing staff at about 300,000 tons of wheat annually or roughly one-tenth of the local production. The operators of water mills of this type in the United Provinces situated on the Ganges canal, apart from working on hire, often purchase wheat from the neighbouring villages, grind it into *ata* and send the produce to the cities by boat.

Power driven *chakkis* are generally located in or near retail markets. The retailer himself may sometimes be interested in operating a *chakki*, in which case the *chakki* may adjoin the retail premises. The *pakka arhatiyas* or large wholesalers do not operate *chakkis*.

When the consumer has bought the kind of wheat he wants (the usual unit is 10 to 15 seers) he wraps up his purchase in a piece of cloth or places the wheat in an old kerosene tin and carries it himself to the nearest *chakki*. Here he either cleans and dresses the wheat himself by passing it through a sieve which is usually kept on the premises (plate facing page 295) or the wheat may be dressed and winnowed by women who perform odd jobs about the markets for a living. When that has been done the wheat is carefully weighed by the *chakki* operator on a small beam scale and the weight is noted on a slip of paper which is placed with the wheat pending its conversion into *ata*. Each customer's wheat is then ground strictly in rotation and when the grinding is complete the owner takes the product with the original slip and has it weighed again. A small deduction known as *urai-jalai* is made by the *chakki* owner to allow for loss during grinding at a rate which varies from $\frac{1}{2}$ seer to 1 seer per maund according to custom, locality and season of the year, e.g., it is higher during the monsoon. The milled product is, if desired, subsequently sifted in the home to remove the larger bran particles.

Practically the only product turned out by all types of stone mills is *ata*. *Ata* is used extensively to make *chapatis* which are the staple articles of food in all the great wheat producing tracts. It is also used for making *puris*, *kachauris* and other preparations (plate facing page 61). In preparing *chapatis* the *ata* is first made into a moderately stiff dough by the addition of a little water. The dough is well kneaded and a small quantity is flattened out into the shape of a thin pancake and is placed over the fire on a well-heated iron pan or girdle for a few minutes (plate facing page 295).

Semolina (*rawa* or *suji*) may also be prepared by means of the hand *chakki* but on a very small scale. The practice exists

mainly in Central and South India and in a few parts of Northern India. The mode of preparation is as follows :—

The wheat is first soaked in water for a period of from 6 to 12 hours to facilitate the removal of the outer skin (bran). It is then partially dried—not in the direct rays of the sun—and subsequently ground. The ground product is gently rubbed on a piece of thin cloth tied tightly over the open end of a basket or sieved through a fine muslin cloth. The finest granules pass through and the larger products remain on the surface of the cloth. These are in turn separated into semolina (*suji*) and bran by winnowing. These operations are exclusively performed in the household as and when required.

Many enquiries were made to ascertain whether semolina was ever turned out by power driven *chakkis* and the information obtained showed that while it was possible to prepare semolina by this means, in practice this was never done as the type of semolina produced by the modern roller mills had a better appearance and was generally preferred.

(2) ROLLER-MILLS.

In recent times there has been considerable development in flour milling by modern roller machinery, manufactured in and imported mainly from the United Kingdom and Germany. The disintegration of the grain is done by means of grooved steel or chilled iron rollers worked by steam or electric power. These mills are operated as private or public companies and unlike the small stone mills or *chakkis* which ordinarily operate on hire, the large roller mills purchase their own raw material, their chief concern being the sale of the manufactured products. The grinding capacity of these mills varies from about .7 tons to 7.7 tons per hour and their total potential capacity annually is in the neighbourhood of 2 million tons of which the mills situated in the Punjab have a capacity of over 500,000 tons, those of Bengal (mainly Calcutta) 360,000 tons and the United Provinces' mills 280,000 tons.

In the small stone mills described earlier the grinding is done in one operation. With roller mills the system is one of graduated reductions as the wheat passes through various stages. Each "break" reduces the grain a little. Separations by means of sieves of varying degrees of fineness are made between these reductions, the partly ground wheat being carried on to the next "break" for further processing, while the finished products are sacked off ready for the market.

The wheat is first cleaned in order to remove all impurities and foreign matter such as dust, chaff, weed-seeds, etc. This is done by putting the grain through a series of graduated sieves and cleaning machines. The wheat is then washed and scoured and a magnetic separator extracts any metal particles such as nails, bits of wire, etc., which would damage the rollers.

After cleaning, the wheat goes through the process of conditioning to modify its water content. The object is to bring the wheat

into a physical state so that the husk or bran may be easily separated from the endosperm. During conditioning, the moisture content is considerably increased and again reduced. Some of the moisture is also lost later on during the process of grinding but a part of it remains in the products. The total weight of the various products should, therefore, be slightly more than the amount of wheat actually ground. This constitutes what is known as the "milling gain" and actual figures supplied by one mill, which are given below, will enable some idea to be formed as to the extent of this gain.

	Maunds.
Wheat purchased during 1934-35	873,902
Wheat in hand at the end of the year	3,005
Wheat used	870,897
Deduct for refraction (actual impurities found) ..	18,235
Wheat actually milled	852,662
Total weight of products obtained	884,745
Gross gain	32,083

This gives a moisture gain of 3.8 per cent on clean wheat. As refraction amounted to 2.1 per cent of the wheat milled, the net milling gain comes to 1.6 per cent. The percentage gain, of course, varies from area to area and depends upon the efficiency of the mill, the condition of the wheat as delivered to the bins and also climatic factors.

In Europe and abroad the chief concern of the miller is to attain and maintain uniformity in the quality of his products, but it cannot be said that this principle applies to Indian mills. The reason for this lies in the market conditions under which flour, *ata* and other products are sold. The trade in *ata* and flour is burdened by an excessive number of marks and brands covering products with every possible degree of variation in quality and Indian millers either individually or as a body seem to make no attempt to conform strictly to a few standard qualities of product.

(a) *Number and location.*—The majority of the large roller mills are located in the main areas of production. The Punjab (including Patiala State) has 19 mills, the United Provinces is second with 16, Bihar has 8, Sind has 7 mills of which 4 are in Karachi itself. In the main consuming centres Bombay has 13 mills, Bengal possesses 11 at Calcutta, Delhi 3 and there is one each at Indore, Ujjain and Bangalore (*see map facing page 294*).

(b) *Cost of milling.*—The costs of milling vary from one mill to another and from one district to another but no general survey has been attempted. The following actual figures supplied by the courtesy of a mill in Northern India will, however, enable some idea to be formed of milling costs and the various items of expenditure. The total throughput of wheat milled by this establishment during

the year 1934-35 was 870,897 maunds and the total expenditure during the same period came to Rs. 2,44,895-8-7 as under :—

	Rs.	A.	P.
Stores and coal, twine, filling and sewing charges on wheat	68,496	3	5
Interest on loans and deposits	13,436	12	11
Commission, brokerage and discount	28,834	10	9
Charges on consignments under dispute	1,273	9	0
Contribution to pool association	8,949	0	0
Provision for income-tax	4,000	0	0
Establishment and miscellaneous expenses	62,603	0	6
Depreciation	57,302	4	0
Total expenses	2,44,895	8	7

On this basis the bare cost of milling one maund of wheat during the year in question was Re. 0-4-6 but so many factors are liable to affect the cost of milling that the instance quoted above cannot be regarded as representing the average cost of milling in India. For example, the greater the volume of wheat milled the lower are likely to be the relative costs of production, and the greater the distance which separates the mill from the source of supply of mill stores, e.g., coal, etc., the higher must be the costs.

(c) *Products*.—The process of milling does not end merely with the production of one kind or quality of flour, *ata*, semolina and bran. Each product may in turn be graded according to texture or degree of fineness and colour and each mill has its own grades of products with distinctive trade marks or brands. Some of the mills, particularly in the port areas, conduct daily baking tests as a check on the quality of their daily output. This is necessary as the mills at Calcutta, Bombay and certain other cities cater for a better class of custom which demands a high grade flour for bread making and for cakes, and to a very small extent for biscuits of the European type. The proportion of the various products manufactured varies according to the demand in a particular market.

The main consideration of the smaller upcountry mills is not the extraction of white flour (*maida*) which constitutes the endosperm of the grain but the preparation of *ata* which includes part of the outer bran and is customarily used in making *chapatis*. On the other hand in large centres such as Calcutta and Bombay where there are numerous Europeans and Indians who have acquired a taste for leavened bread (*dabai roti*) the market for “superfines”, “household flours” and “patents” is the chief consideration of the roller mills and the manufacture of *ata* is relatively less important.

A milling centre, such as Delhi, falls between these two categories owing to its unique situation. As the capital of India it houses a large number of Government servants who with their dependents constitute an important section of the population of the province. There is also a fairly large resident European community and the number of transients of all nationalities during the course of the

winter months is probably larger in comparison with its normal resident population than is the case in any other city in India with the possible exception of Bombay and Calcutta. The local mills, therefore, endeavour to cater for both types of market.

It will be seen from Appendix XV that the proportion of flour (*maida*) manufactured by the large roller mills is approximately 41 per cent but the proportion varies from province to province. In the Punjab, for example, *maida* represents only 27 per cent of the total quantity of products manufactured; in the United Provinces the proportion is 21 per cent; in Bihar 27 per cent; in Bombay 65 per cent; in Bengal 55 per cent; and in Sind 50 per cent. At Delhi and Indore roughly 50 per cent of products milled locally consist of flour but at Patiala the proportion is only about 35 per cent.

In regard to *ata* the all-India output is about 34 per cent of the total products milled. The output ranges from 62 per cent in the United Provinces to 15 per cent in Bombay. Roughly 40 per cent of the products manufactured in the Punjab represent *ata*, 59 per cent in Bihar, 25 per cent in Bengal and 23 per cent in Sind and 30 per cent in Delhi.

The production of semolina (*suji*) forms about 8 per cent of the whole. By far the largest quantity (45,000 tons) is manufactured in the Punjab and the proportions range from 18 per cent in the Punjab to 2 per cent in the United Provinces, Bihar and at Indore.

Bran represents 17 per cent of the total quantity of products and the proportions range from 22 per cent in Sind to 12 per cent in Bihar. The position is summarised in the following table :—

*Proportions of wheat products milled in India by the large roller mills.**

	Maida. %	Suji. %	Ata. %	Bran. %
Punjab	27	18	40	15
United Provinces	21	2	62	15
Bihar and Orissa	27	2	59	12
Bombay	65	..	15	20
Bengal	55	5	25	15
Sind	50	5	23	22
Delhi	50	5	30	15
Patiala	35	15	36	14
Indore	50	2	35	13

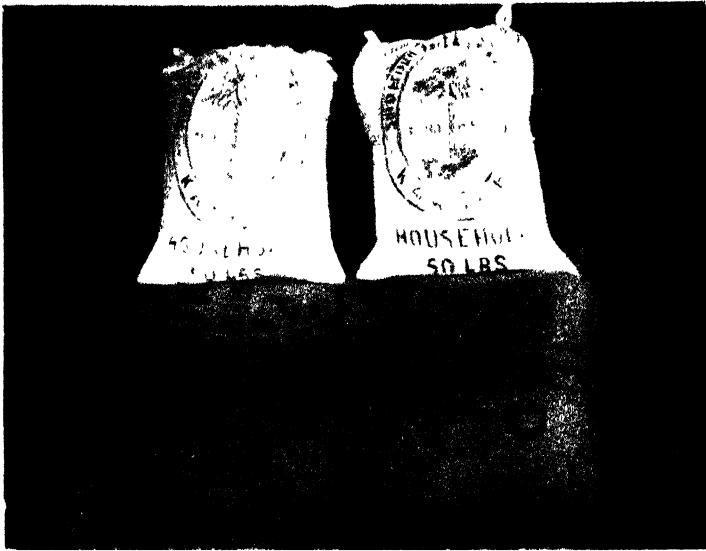
(* Based on Appendix XV).



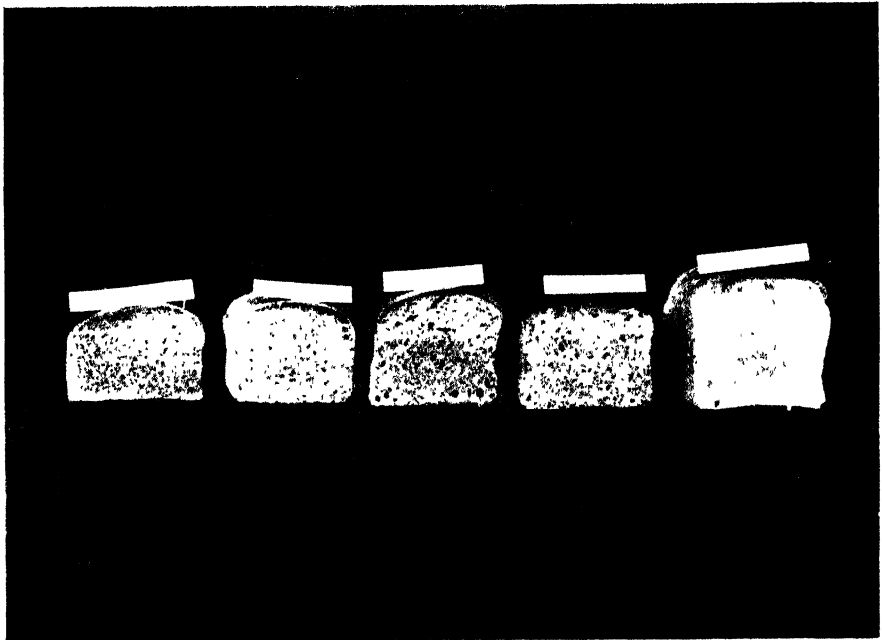
DIFFERENT TYPES OF PACKING FOR MACARONI AND VERMICELLI. (All are imported with the exception of the Indian manufactured article—put up in the brown paper packet seen in the top right hand corner of the plate.)



A RETAILER OF WHEAT PRODUCTS.



A TYPE OF PACKING USED BY A MILL FOR THE EXPORT OF FLOUR TO BURMA.



A

B

C

D

E

Loaves baked under ordinary commercial conditions from :—

A—Bijapur red wheat *ata* ; B—Bakhshi wheat *ata* ; C—Khapli (Emmer) wheat *ata* ; D—Pissi wheat *ata* ; and E—High grade Punjab maida (flour).

Every effort is made by the mills to regulate the output and sales of products so as to keep the minimum stocks. The products are stored in bags in *pakka* godowns with brick floors. In order to avoid the effect of moisture some mills in the United Provinces and Bengal place the bags on wooden sleepers and bamboo mats. Wheat products are stored for very short periods during summer. During the winter months storage up to 5 or 6 weeks is reckoned to be safe. Deterioration sets in early in the rainy season and the damage to stocks in 2 or 3 months has been estimated at a minimum of 2 per cent. Freshly milled products also lose anything up to 1 per cent in weight during the first week of storage on account of dryage.

Wheat products are handled in bags of the type commonly used in the wheat trade. New B-twill gunnies are ordinarily used for the medium grades of flour. Second-hand B-twills in good condition are used for *ata*, but on occasions new bags may be specified by buyers. A-twills which are heavier, stronger and consequently more expensive, of a type similar to B-twill, are adopted for the highest grades of flour and for semolina. The latter is sometimes packed in double bags. Bran is usually filled in old second-hand bags. Small cotton sacks are also being used for flour only and are a recent innovation. At Karachi, for example, it is customary to pack flour for the Rangoon market, in small cotton bags known as "pockets" containing 50 lbs. each and these bags are in turn enclosed in an ordinary gunny sack which holds four such pockets (*see* plate on opposite page).

Each bag of wheat products is clearly marked by stencil when it leaves the mill. Frequently the name of the mill may appear on one side of the sack and on the other the weight and brand or trade mark. The mouth of each bag is generally stitched by hand; a few mills have a machine for this operation. For the southern Indian trade the ends of the twine used for sewing up the mouth of the bag are enclosed in a lead seal which bears the imprint of the mill's name. In Northern India this precaution is not practised. In Southern India the price of the product is generally quoted in terms of rupees per bag of 196 lbs. including the price of the container. In Northern India quotations are always stated in rupees per maund net, and it is the custom of the trade in those parts to charge the buyer separately for the bags, in which the normal filling per bag is 2½ maunds for flour, 2 maunds for *ata* and 1 maund for bran. For instance all the northern mills charge the following rates:—Rs. 1-1-0 per bag for A-twills, Re. 0-15-0 per bag for B-twills, Re. 0-11-0 for each second-hand B-twill, and Re. 0-6-0 for half bags known as *kattas* or cut bags and Re. 0-4-0 for sound and serviceable bags.

These scheduled rates are far in excess of the current price of gunnies and the difference between the original cost of the container to the mill and the price recovered from the buyer of the product constitutes the chief, and in some cases almost the only source of profit to the mill. Indeed the net price of *ata* may frequently be below the price of wheat, this being possible, partly because the profit on the transaction lies in the extra charge made for the bag.

(3) RELATION BETWEEN THE PRICES OF WHEAT AND ITS PRODUCTS.

Typical price spreads between wheat and its various products based on the average annual prices of these commodities in Calcutta and Karachi are shown in the table below (*see Appendix LI*). The monthly variations are illustrated on the diagrams on page 304 from which it will be seen that on the whole the prices of products seem to be fairly closely associated with the cost of the raw material and, while the spreads may vary from month to month, long term differences are not very pronounced except in one or two instances. In Karachi, for example, the average spread over 1933-1935 between one of the best grades of flour milled locally and wheat is Rs. 1-2-1. The minimum was Re. 0-10-1 in January 1934, but the maximum was as high as Rs. 1-14-10 in October 1935, owing to the Italo-Abyssinian war and the anticipated demand for flour which many flour merchants in Karachi expected to materialise from Abyssinia. In Calcutta the best grade of flour ranged from Rs. 4-14-0 per maund in November 1934 to Rs. 6-2-0 in February 1933. Compared with the price of wheat locally the spreads fluctuated between Rs. 1-10-9 in January 1935 and Rs. 2-4-6 in October 1933.

Average prices of wheat and products.

Wheat and Products.	Calcutta.			Karachi.		
	1933.	1934.	1935.	1933 (July-December).	1934.	1935.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Wheat ..	3 10 8	3 1 9	3 6 2	2 15 5	2 10 11	2 14 10
Ata No. 3 ..	3 14 8	3 7 0	3 10 9	3 5 3	3 0 1	3 6 0
„ No. 2 ..	4 11 0	4 2 7	4 5 9	3 6 10	3 1 11	3 10 4
„ No. 1 ..	5 1 9	4 9 0	4 13 2	3 13 4	3 9 11	3 11 4
Flour No. 3 ..	5 1 2	4 7 4	4 9 6	..	..	..
„ No. 2 ..	5 7 2	4 13 4	5 0 11	3 11 8*	3 8 3*	3 13 4*
„ No. 1 ..	5 11 3	5 1 4	5 4 10	4 0 7†	3 9 6†	4 1 9†
Suji ..	5 7 6	4 13 4	5 1 4	4 2 7	3 9 7	4 0 1
Bran ..	2 2 5	1 12 4	1 14 0	..	..	..

The prices of the various wheat products like wheat in different markets also fluctuate fairly closely. This will be seen from the diagram on page 305 which illustrates the movement of *maida* and *ata* prices in Calcutta, Bombay and Cawnpore (*see Appendices LI and LII*).

* Household.

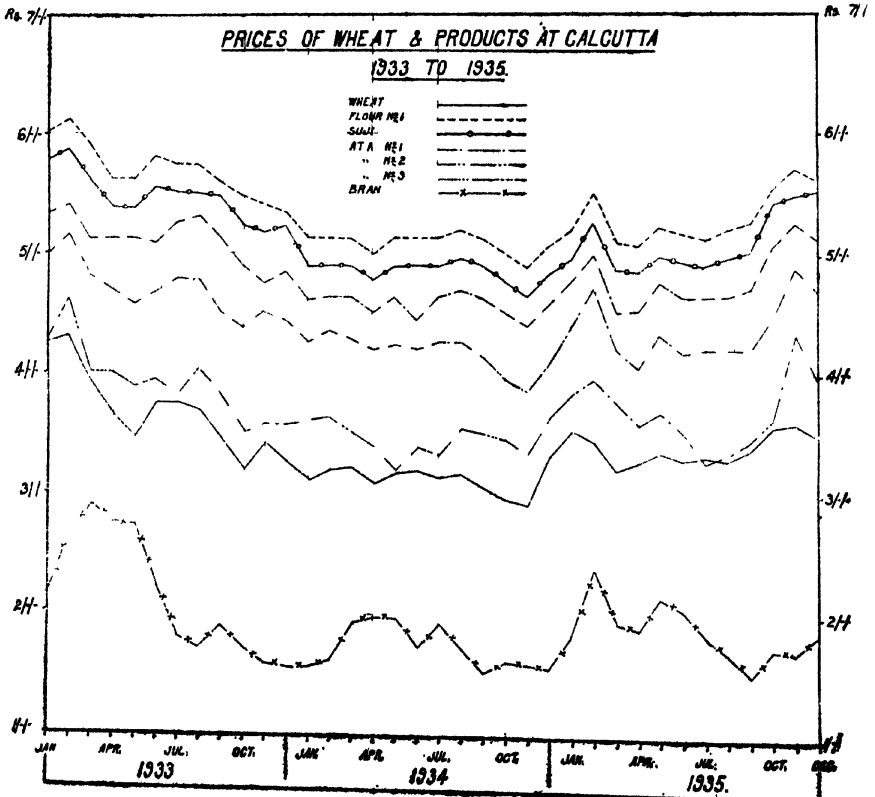
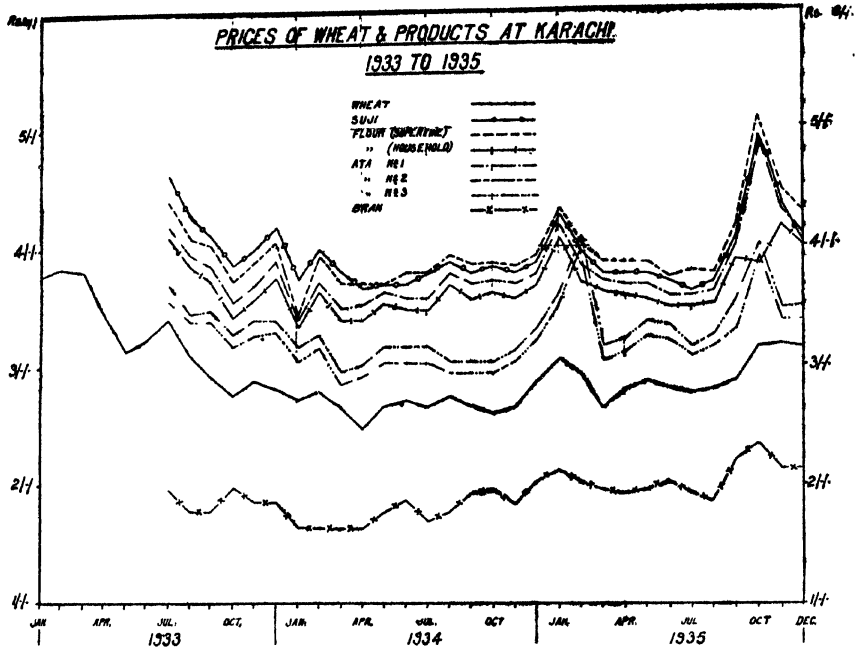
† Superfine.

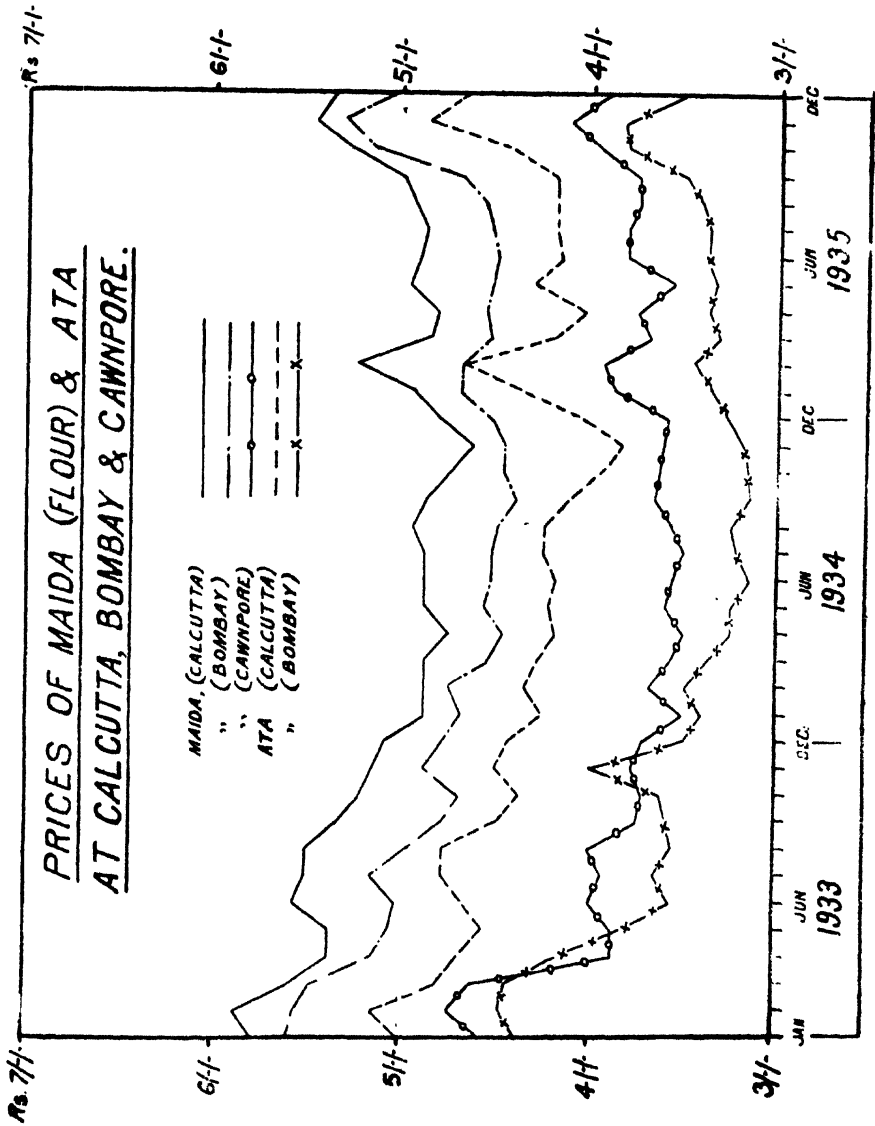
(4) QUALITIES AND BRANDS.

One of the features of the Indian trade in wheat products is, as already mentioned, the great number of brands or trade marks used by manufacturers and wholesale traders. It should be noted that the retail trade does not recognise or use trade marks and the retailer of flour or *ata* displays his wares without reference to price or description. As an indication of the number of brands put on the market by mills, one mill in Bihar has 10 different brands for its various products. These consist of 7 covering *ata*, 2 for flour and 1 for semolina. Another mill in the same province has 5 brands. These are distinguished not only by stencil marks but also by the colour of the twine with which the mouths of the bags are stitched. Allowing a conservative figure of 5 brands per mill it will be seen that there must be at least 400 different products put on the market. Examples of different brand names are :—"Anchor", "Elephant", "Cycle", "Man", "Deer", "Sword", "Scissors", "Gandhi", "Crescent", "Peacock" and various others in which the names of Hindu mythology are freely drawn upon. It is also common practice to number various qualities of *atas* as No. 1, No. 1½, No. 1¾, No. 2, No. 3, etc. But a sample of No. 1 *ata* produced, say, by a mill in the Punjab may be quite different to another sample also sold as No. 1 *ata* but milled in the United Provinces, or different from a No. 1 *ata* produced by another mill in the Punjab, and the No. 1 *ata* of a mill which is usually made from a particular type of wheat may be made of entirely different wheat if this should happen to be cheaper. From the diagram on page 305, which shows the price variations at three important centres of flour and *ata* bearing similar grade marks, it will be seen that while the general trend of values is fairly common to all the products, the individual fluctuations are often very dissimilar. Apart from purely market considerations it would seem that some of the variations are possibly due to inconsistencies in quality. The names of these brands are merely so many additional counters in the competitive game. Since there is no fixed standard of quality a seller bent on securing a certain order may offer a higher sounding grade, say, No. 1½ at a cheaper rate than his competitor's No. 2, and actually deliver a lower quality of *ata* made from a cheaper type of grain than the No. 2 in question. This can hardly be regarded as fair competition and it is a matter for consideration by the roller mills whether it could not be eliminated by coming to a general agreement regarding suitable standards of quality for different grades.

The general objection of course is that the large and increasing number of power driven *chakkis* seriously affects the roller mills and they are therefore compelled to adopt every possible device to bring their product down to a competitive level of price. This involves a constant lowering of the quality of grain used, e.g., cheap *khatti* wheat or wheat with a high proportion of barley. It can be readily understood therefore why sellers in the main producing districts are convinced that roller mills are not interested in raising the standard of quality or in buying good wheat.

So far as *ata* is concerned it seems impossible for roller mills to avoid competition from the *chakkis* but in regard to the various





types of white flour (*maido*) and to some extent also *suji* and *rawa*, the *chakki* is not at present in a position to compete. Individual mills may be able to establish a growing trade and maintain it in the face of competition by putting on the market for domestic use good reliable quality products in small branded containers (see later). For larger users and for the export trade and distant markets, in south India for example, the present methods of business will continue and it seems highly desirable in order to maintain the reputation of the produce and to eliminate unfair competitive practices that all the roller mills should adopt standard grades of quality and methods of marking the different types of flour and that a responsible body should be entrusted with the formulation and maintenance of the standards.

B.—Distribution.

(1) WHOLESALE.

The mills generally sell their products through agents on a commission basis but some mills in the Punjab have recently established their own selling organisations for local sales. As a rule millers do not distribute direct in wholesale quantities to bakers and confectioners. This is done by the selling agent who usually has a defined jurisdiction, normally confined to one town, but in certain large urban areas a mill may have more than one agent. From those towns in which the mill is unrepresented it is customary to receive orders from the buyer direct, and canvassers are often sent to such markets. Mills' commission agents generally have written agreements with their principals and the rates of commission paid on sales vary from mill to mill. Some mills pay a flat rate of commission on the sale of all types of wheat products, which in some cases is Re. 1 to Rs. 2 per cent or in others from Re. 0.6-0 to Re. 0.12-0. Others again pay separate rates for different products. For instance two north India mills in the same town have the following rates :—

Products.	Mill A. Per cent.			Mill B. Per cent.		
	Rs.	A.	P.	Rs.	A.	P.
Flour	3	2	0	3	2	0
Ata	2	0	0	1	9	0
Bran	1	9	0	1	0	0

These rates are high owing to the fact that these two mills do not give any discount to their buyers or agents whereas certain other mills give a discount of Rs. 1-9-0 to all buyers of minimum lots of 100 bags each of flour and semolina. No discount is allowed on *ata* and bran.

(2) NOTE ON BAKERIES AND BAKING.

(a) *Chapatīs*.—A *chapati* is also known as *phulka* when it is made in a small size, and the generic term *roti* may also be applied to denote all types of *chapatis*. *Chapatīs* are, for choice, eaten when freshly baked and are mostly made in households just prior to consumption. They are on sale also in bazaar food-shops. The type of customer who patronizes the average food-shop may be (i) the

urban dweller who lives alone without his family members, and consequently undertakes no cooking arrangements, and (ii) casual visitors and persons from the rural areas. Owing partly to better facilities for communication and an increase in the cultivation of cash crops there is a growing tendency on the part of the rural population to pay more frequent visits to the towns and cities. In consequence, therefore, the bazaar food-shop trade in *chapatis* and other cereal preparations, which is at present relatively small, shows signs of expansion.

The practice of serving customers in food-shops varies. In Hindu shops it is customary to provide the patron with free curries and *dal* usually of a somewhat indifferent quality. On the other hand, in the Muslim shops curries and condiments are charged extra with the exception of a few food-shops in which a small quantity of *dal* is given free. In the bazaar there are usually two general types of *chapatis*, one being large and thin and 9 to 12 inches in diameter, the other being smaller and thicker, although not necessarily so, and measuring 5 to 7 inches. The size of a *chapati* is entirely a matter of taste. A *chapati* may measure more than 12" in diameter and, on the other hand, it may be as little as 4". A large thin *chapati* frequently contains a small proportion of *maida* which is mixed with *ata* to the extent of 10 to 20 per cent. These are apparently purchased mainly by the Muslims and rural visitors to the city who may sometimes bring their own pickles and condiments with them.

The price for both the types of *chapatis* is the same, viz., 3 pies each. This price seems to be general throughout the whole retail trade and has apparently not varied for a considerable period.

For a series of purchases in the course of a day from 4 food shops in Delhi, 4 *chapatis* were obtained from each shop at the price of Re. 0-1-0. The weights varied from 17 to 24 tolas in the case of the smaller *chapatis* and from 30 to 35 tolas for the larger ones. Allowing for the water absorption in the course of baking (see Chapter II) the total number of small *chapatis* obtained from one seer of *ata* would be 22 and, at the price of 3 pies each, this would represent a total return to the baker of Re. 0-5-6 per seer of *ata* used, including also the return on *dal*, etc. In the case of the larger *chapatis* about 13 would be obtainable from a seer of *ata* and the total return per seer to the baker would be Re. 0-3-3 per seer of *ata*.

This may be compared with the gross return to the baker in respect of bread (*dabal roti*) as referred to below. The number of loaves weighing 9 to 10 ozs., each obtained from one seer is 5 and retailing at the rate of Re. 0-1-0 per loaf the gross return per seer of flour used is Re. 0-5-0. The cost of *maida* in this case will probably be about 5 pies per seer more than the price of *ata* used for making *chapatis*. Whether the comparison is based on the small *chapati* accompanied by curry or *dal* or on the large *chapati* alone, it would appear that from the consumers' point of view better value is obtained by consuming *chapatis* than buying "*dabal roti*".

(b) *Bread (dabal roti)*.—Machine made bread appears only to be manufactured by one or two concerns in Calcutta and Bombay.

Except in a few of the larger cities where there is a limited number of bakeries operating under relatively modern hygienic conditions the great bulk of the bread of the type commonly baked in western countries, the local counterpart of which is known to Indians as "*dabai roti*" is kneaded by hand and is made under primitive conditions, often in insanitary surroundings.

Bread is not sold "over the counter" in India to the same extent as it is in so many other countries. A very small trade of this type is carried on by a few caterers and confectioners in Calcutta, Bombay, Delhi and some other large cities and is confined mainly to special kinds of rolls, buns, loaves and brown bread.

The number of bakeries in India is not known. Those which confine their activities to the preparation of bread alone are relatively limited and the greater proportion of the bread consumed by the large middle class community and in the innumerable tea or coffee shops of the country is made in establishments which cater not only for the demand for bread but prepare buns, country biscuits and other kinds of baked cereal foods. It is only possible, therefore, to indicate approximately how many bakeries operate in certain localities. In Delhi, for example, there were 105 bakeries in 1935, and in Lahore 218. As the population of these two cities in 1931 was 447,000 and 429,747 respectively, there appears to be no relation whatever between the ratio of bakeries to population. This is also confirmed in the Bengal report which records the number of bakeries engaged solely or mainly in bread making in Calcutta—a city with a population of 1,193,651—as 123 only. Six other large towns are collectively reported to contain 105 bakeries (including 64 at Chittagong and 20 at Narayanganj). In addition to these there is apparently a large number of very small bakeries and makers of indigenous types of biscuits, etc., and it is estimated that the number of these in Bengal is about 470. In the United Provinces a record was obtained of 134 bakeries in 20 large towns. This figure also takes no account of the number of very small establishments of the tea-shop *cum* bakery type.

Various municipal Acts, of which the Punjab Municipal Act, 1911, may be regarded as typical, lay down that any place in which bread, biscuits or other such food of this kind is prepared or baked for sale has to be licensed and there are also bye-laws for the inspection and proper regulation of bakeries (see Appendix LIII). While it is evident from the number of prosecutions lodged by the authorities that conditions are by no means satisfactory (there were, for instance, 39 prosecutions in Delhi during 1934-35) it was observed during this enquiry that conditions under which bread was being made were often deplorable. There appears to be no regulations fixing the hours during which bread may be baked. Such laws exist in many other countries of the West and in Australia.

The type of flour used depends entirely upon the type of custom for which the bakeries cater. In the tea, coffee shop or restaurant trade quality is not of primary importance and a cheap low grade of flour is often used. Such flour is in fact often a mixture of *ata*

and white flour (*maida*). The large hotels and almost without exception the better class of bakeries and confectioneries and restaurants which cater for the majority of European residents and an increasing number of Indians use high grade white flour or the best it is possible to procure.

Yeast.—With the exception of the very few bakeries in the large cities whose baking is up-to-date the methods adopted by the ordinary type of bakery do not vary appreciably from one part of the country to another except in regard to the kind of yeast used. In Northern India a form of leavening commonly applied is the yeast prepared from curds. A few bakeries, however, utilise hops imported in hermetically sealed tins from the United Kingdom or Germany. These are usually obtainable from local provision dealers and oilman stores. Hops are used by the better class bakeries in Bombay, Hyderabad (Deccan), in the Central Provinces and in Bengal. The smaller establishments particularly in Bombay, Madras, Hyderabad (Deccan), and parts of Bengal, use toddy (the fermented juice of the palm tree). Pure dry yeast is also available and is used by one or two of the most up-to-date confectioners. In Travancore for example, although this kind of yeast can be bought, its demand is negligible because toddy is a cheaper country substitute.

The method of preparing commercial yeast from hops or curds was apparently regarded as a trade secret and considerable difficulty was experienced in obtaining information on this matter from bakers. The methods of preparation appear to differ very widely and the following recipe is only one of many :—

“ About $\frac{1}{2}$ *chhatank* of hops (obtainable at the local provision stores at 12 annas a packet) is boiled in 8 seers of water. As the boiling goes on three well-washed potatoes are added and boiling continued for another five minutes. The utensil is then removed from the fire and allowed to cool. When cool, the liquid is strained. Condiments such as cloves and cardamom and sugar are added. The yeast thus prepared is used after two days.”

The method adopted by bakeries in Madras may also be quoted :—

“ Half an ounce of hops and three ounces of potatoes are boiled for about two hours in about a gallon of water. The liquid is then allowed to cool down, when it is filtered. The potato is then peeled, mashed and added to the decoction. To this mixture about half a gallon of “starter” and about $1\frac{1}{2}$ gallons of water are added and kept over-night for 12 to 15 hours for fermenting. In cold season the mixture takes a longer time for complete fermentation than in hot weather. Some of this fermented liquid is kept back to be used as starter for the next day. For every gallon of fermented liquor 2 to 4 pounds of wheat flour are added and allowed to ferment for three hours.”

There seems to be little doubt that the exceedingly poor quality of the average Indian loaf and its tendency to develop a sour flavour

which is particularly in evidence when the bread has lost its freshness is due largely to the yeast with which it is leavened.

Effect of quality of flour on the bread.—Apart from the yeast, the quality of bread also varies according to the grade of flour used. Moreover the bread is often prepared under uncontrolled conditions of oven temperature, length of time given to kneading, etc., so much so that each day's baking is not always consistent in quality. In order to test the characteristics of high and low quality flours, a number of baking tests were carried out in Delhi under ordinary commercial conditions at two different bakeries and the results indicate without any doubt that flour prepared from high grade *sharbat* wheat grown in the Punjab is superior to the product milled from mixed wheats of uneven texture such as those used in Delhi, the United Provinces and Bihar. The superiority of the high grade flour was particularly shown by the greater yield of loaves. The variation between the outturns of bread from the highest and the lowest grades of flour tested was about 14 per cent. The difference went deeper, however, for the bread made from the Punjab flour was whiter in colour and rose better than the loaves made from the flours milled from mixed wheats. The latter were also decidedly inferior in texture and crumb. Baking tests were also made on the *ata* ground from hard *durum* wheats grown in the Central Provinces and in Bombay Presidency. A sample of *ata* obtained from *Emmer* (*khapli*) wheat, also grown in Bombay, was tested. The results of these bakings are shown in the plate facing page 301. For comparison the loaves made from the *durum atas* are seen placed alongside an ordinary commercial loaf made from a high grade white Punjab flour. The same methods of baking were used in all cases and the difference in the "rise" will be at once apparent. It seems evident, therefore, that *durum* wheats are not so suitable for bread-making as the common wheats (*T. vulgare*).

(c) *Cost of baking.*—It is impossible to particularise in regard to costs as these vary with each concern. Enquiries were made at a bakery of moderate size in Northern India and the figures supplied by the courtesy of the proprietor may be taken as fairly representing typical daily costs and profits. These are tabulated below :—

Daily Expenditure—	Rs.	a.	p.	Rs.	a.	p.	
Cost of 3 maunds 15 seers and 12 <i>chatanks</i> flour		16	6	0	
Sugar, salt, yeast, bran, eggs, etc.	1	8	0			
Wood fuel	1	12	0			
Rent, water and electricity	1	4	0			
Salary and food for 10 assistants	7	0	0			
“ <i>Dasturi</i> ” or tips in kind to customers’ servants at one anna per rupee	2	6	0			
					13	14	0
Total					30	4	0

Estimated Income from sale of bread—

Estimated Income from sale of bread—				Rs.	a	p.	Rs.	a.	p.
Ordinary loaves @ 18 per rupee	..	..	..	10	7	0			
Special loaves @ 16 per rupee	..	..	..	12	0	0			
Special double loaves @ 8 per rupee	..	..	..	5	0	0			
French loaves @ 12 per rupee	..	..	..	6	13	0			
Brown loaves @ 12 per rupee	..	..	..	3	3	0			
Miscellaneous	..	..	..	0	11	0			
				<hr/>					
Total estimated income				..	.	.	38	2	0
Deduct Expenditure				..	..	..	30	4	0
				<hr/>					
Gross daily profit (approximately)							7	14	0

This works out to roughly Rs. 6 per sack of 2½ maunds but making due allowance for bad debts, depreciation of utensils, losses on account of inferior bakings and loaves left over unsold, this profit may be regarded as nearer Rs. 5 per sack. The costs of baking in another bakery were found to be very similar, the gross estimated profit per sack of flour also being Rs. 6.

Distribution.—A large quantity of bread finds its way to consumers—particularly those residing in the suburbs of towns and cities—through the paid employees of the various bakers and to a lesser extent through hawkers. As a rule the bicycle with a tin box affixed to the rear carrier is the chief means of conveying the daily supplies of bread to customers. Motor and horse vans are a rarity except in the larger cities. The former class of persons are employed on monthly salaries ranging from Rs. 10 to Rs. 25 with, in addition, free board and lodging. Their time is not wholly taken up in the distribution of bread, for they also help in the kneading of the dough and perform various tasks in the bake-house. They may also be entrusted with the collection of bills or accounts on behalf of their employers.

(d) *Price of bread.*—There are considerable variations in the price of bread in different places and in the product of the different bakeries in the same town. The main factors affecting the price of bread, apart from the cost of flour, are the costs of manufacture and distribution, but there are other minor elements which also to some extent determine prices, such as the success or failure of the day's baking and the number of stale loaves left over from the previous day.

In large concerns a superior grade of bread is produced, but the overhead charges may be high. On the other hand, there are many small establishments where the baker himself may do his own distribution. It was found, for example, in Lahore, that there were three different rates for different qualities of bread. One quality was sold at 8 lb. to the rupee, another 9 lb. and a third at 12 lb. to the rupee. These differences were due apparently not only to the quality of the bread itself, but to the system of distribution.

The usual retail price of a fair-quality loaf, weighing about ½ lb. is from Re. 0-0-9 to Re. 0-1-0, but bread baked from low grade flour or loaves that have not risen well or which may be a trifle stale may retail for as many as 24 to 27 per rupee. There is exceptionally

keen competition in this trade, so much so that to secure and maintain custom the weights of the loaves are cut down in order that the larger number which it is then possible to offer for a given price might make a greater appeal to the buyer. In these circumstances, therefore, there is little or no regularity in the weights of the loaves sold by the average baker and it seems desirable that the consumer should be protected by prescribing a minimum weight of the loaf by means of municipal regulation. A measure of this kind would also be in the interests of the bakers themselves since it would go a good way towards eliminating unfair competition.

(3) NOTE ON THE TRADE OF BRANDED WHEAT PRODUCTS IN SMALL CONTAINERS.

The extent of this trade is difficult to gauge with accuracy but it does not seem to be very large except possibly in the cities and one or two large towns. The bulk of the output of flour and *ata* from the roller mills is disposed of through wholesale channels directly to the retailer and thence to consumers. The various trade marks or brands are current up to the point at which the product comes into the hands of the wholesale distributor, but once the goods have passed from the wholesaler to the retailer all means of identity by brands or trade names have disappeared and the goods are sold in loose bulk merely on appearance.

There is, however, a small trade in branded flour which is put up by a few firms of packers, who purchase their flour directly from a flour mill and pack it in conveniently sized tins or packets bearing the packer's name or brand. Two or three examples of this type of trade are to be seen at Bombay and a popular brand of flour is put on the market by a well-known firm of wholesale provision dealers in 7 lb. tins and sold in most parts of Central and Northern India. The price of the 7 lb. tin is just about double the price of loose flour of an equivalent weight. The product is obtained from a flour mill in Bombay and packed in that city.

Another type of product sold in branded containers is *ata*. There is quite a large sale of *ata* put up in paper bags in Calcutta. For example 14 different brands of coarsely ground *ata*, all known by different names, were on the market in the early part of 1936. These brands are never constant and changes are always taking place. Some drop out and others with new names are being constantly created. The weights in which these packets are put up are 2½ seers, 5 seers, and 10 seers in brown paper bags. A 10 seer lot may also be had in a cloth bag for 2 annas extra. It is significant that in Calcutta there appear no packing concerns using their own brand names in the marketing chain between manufacturer and consumer.

Owing to the fact that trade marks in respect of wheat products are not registered in India many cases occur of brands being counterfeited and from time to time prosecutions have to be instituted by the manufacturers and owners of the brands. Instances were brought to notice during this survey of one of the Karachi mills' trade marks being counterfeited in Burma and the re-use of this

concern's pockets (a small 50 lb. cotton bag) with a totally different quality of contents.

Self raising flour is imported in tins from the United Kingdom and forms a very small item in the consumption of cereal products. This type of flour is only used by the better class bakers and confectioners in cities and large towns and in European households for the preparation at home of cakes, etc.

(4) MACARONI AND *Sewayan*.

As far as can be ascertained macaroni is only manufactured in one small factory in the Meerut district of the United Provinces. The factory belongs to the Catholic Orphanage and the plant was imported from Italy and erected in 1884. Nine different types of products are manufactured of which those most familiar to the consumers in India are probably macaroni, spaghetti and vermicelli. The total annual output of products ranges between 7 and 8 thousand pounds. The output represents only about 10 per cent of the full working capacity. The operators do not advertise their products and the fact that macaroni is manufactured in India is known only to a few persons. The products of this establishment are made from fine semolina (*suji*) which is obtained from a nearby mill in the eastern Punjab. The raw material has a golden brown colour and appears to have been selected from hard types of wheats produced in the Punjab.

The operation of manufacture consists of three stages. The semolina is first placed in a drum with water and thoroughly kneaded. The product is then passed to a second cylinder for compression and it is ultimately carried to a third machine which gives shape to the various products. The motive power for the first two processes is supplied by an oil-engine. The last stage of forcing out the dough into the various shapes of the products is worked by hand.

The chief demand, such as it is, is centred in towns in which there is a large European population and supplies are regularly sent to Simla, Naini Tal, Delhi, Calcutta and Bombay.

The products are packed in cardboard boxes, one pound of macaroni being sold at 6 annas. Orders exceeding one maund at a time are charged 5 annas a pound. Loose macaroni is also supplied in wooden boxes at 5 annas a pound for orders not exceeding one maund and at 4 annas on larger quantities. The imported article made in Italy and Australia retails at 7 annas per pound packet.

Sewayan is the local counterpart of vermicelli. Its demand is relatively limited compared with the total amount of other wheat products which go into consumption. Its manufacture is carried on to a fairly large extent in Northern India in the towns of Lahore, Delhi and Lucknow and in other urban areas where the population is largely or predominantly Muslim.

Sewayan does not, it seems, form a regular part of the diet. Its demand is limited and more than one-half of the total demand is associated with the Muslim month of fasting (*Ramzan*) and with the festival (Id-ul-Fitr) which closely follows it, when this product is widely consumed.

Sewayan is prepared in two common forms—the thread-like product similar to vermicelli and the slightly thicker form rather like spaghetti (Plate facing page 61). The preparation of *sewayan* very largely undertaken in the household particularly in the rural areas. The method of preparation is primitive and comparatively simple. The flour is mixed with a little water and kneaded vigorously into a stiff dough. A small quantity of the dough is then taken and placed on the back of an inverted earthen pot and the dough is rolled to and fro between the palm of the hands and the surface of the pot. This gradually shapes the material into a fairly thin thread like form.

In the cities a brisk business of a seasonal nature mainly in the autumn and during *Ramzan* is carried on by a class of persons known as *bharbhunjas*. These are manufacturers of *sewayan* who buy their raw material, usually flour, from wholesale flour merchants and manufacture this product by means of hand presses of which there are two main types. The first is a screw press operating in a cylindrical container the bottom of which is perforated with holes of the required size. The dough is inserted and pressure applied by turning the handle of the press. The second method is a cylinder in which the screw press is replaced by a wooden pestle which very closely fits the sides of the cylinder.

Appreciable quantities of these somewhat crudely manufactured products are sent by rail from one large centre to another. As a rule the packing adopted is in bulk in second hand wooden packing cases which have been previously lined with paper. The trade in packets or cartons is relatively small and appears to originate chiefly from Bombay and South India. When goods are ordered the railway receipts are usually sent per V. P. P. *Sewayan* is consumed after boiling with milk and sugar. Frequently it may be roasted to a golden brown colour before cooking.

(5) WHEAT FLAKES.

A comparative innovation is the preparation of rolled wheat flakes. As far as can be ascertained this is only manufactured in Poona (Bombay Presidency) and is put up for sale in 10 oz coloured cardboard packets lined with transparent paper. It is sold at the same price as a corresponding imported article.

(6) RETAIL DISTRIBUTION.

(a) *General*.—Retail distribution of wheat products is effected by provision shops scattered all over the town. These retailers obtain their stocks either by buying the products from the wholesale distributor or commission agent, by purchasing wheat and having it ground into *ata* at a nearby *chakki* or in a few cases by installing a small power driven *chakki* in their own shops. The average retailer of wheat products also handles wheat and other food grains so that it is generally possible to buy the raw material and the product in the same shop. Occasionally also the retailer may sell other household stores.

The retailer of wheat products displays his stock in trade in little heaps in the front of his shop which is usually open facing the pavement. Goods are therefore in full view and may be examined closely by prospective customers (*see* plate facing page 300). Following the customary practice there are no labels stating the quality, description or price. Bargains are struck after the goods have been priced by enquiry from the shopkeeper, and purchases are made sometimes after a considerable amount of bargaining.

The retailer does not necessarily sell the various qualities of products which he has obtained from the wholesale distributor exactly according to the qualities he has bought and a considerable amount of the flour or *ata* sold has been blended on the retailer's premises. Flour being of whiter texture, is usually added to *ata* in order to brighten its colour. This is apparently done in order to meet the restaurant and tea-shop trade which requires a *chapati* of good colour and one which at the same time can be prepared as thin as possible. Pure *ata* cannot make as thin a *chapati* as *ata* mixed with a certain amount of starchy white flour. Apart from the question of meeting the legitimate demand, there seems to be little doubt that blending is practised mainly as a form of adulteration in order to cheapen costs and obtain a larger margin of profit on the resultant mixture.

Bran does not appear to be retailed in any appreciable quantity. As a rule cattle breeders and dairy farmers purchase in fairly large bulk from mill's agents direct.

(b) *Consumers' (Urban) Co-operative Stores*.—There are it appears about 300 consumers' co-operative societies operating throughout India whose total annual sales amount to over Rs. 50 lakhs. Many are moribund, for example, in Bengal out of 43 societies on record only three or four have been working. Probably the most successful one of all is the Triplicane Urban Co-operative Society which has 25 branches in Madras. Its annual sales amount to over Rs. 9 lakhs and the Society made a profit of over Rs. 16,000 in 1934-35. All these societies work on a cash basis. Many include wheat and wheat products among the items dealt in, but the total quantity so handled is very small indeed.

(c) *Price margins*.—As in the case of wheat, price margins are extremely variable and it is impossible to give an average for the whole country. Two examples may be quoted. In the first instance the differences between the retail and wholesale prices of a complete range of seven different products manufactured by a large mill in the United Provinces were quoted at Re. 0-2-0 per maund only, which represents a little more than 3 per cent. It is perhaps noteworthy that this mill's quotations are based on direct distribution from the mill itself which might account for the low margins. In the second instance, at Delhi the average quotations over a period of five years showed that between 1930 and 1934 three qualities of *ata* ranged from 3 to 6 per cent. dearer than their wholesale equivalents, two qualities of flour were 5.3 and 7.1 per cent. above wholesale and semolina 5.4 per cent. dearer. These ostensible margins may be regarded as a minimum since they do not take into account the common practice of admixture with lower quality as referred to above.

INTER-CHAPTER TEN.

Wheat is still converted into *ata* predominantly by the hand mill or *chakki*, particularly in the rural areas, in which there are also a large number of stone mills (*chakkis*) driven by water or by bullocks and camels. Apart from these there are about 16,000 power driven *chakkis* (oil and electric) engaged wholly or partly in milling wheat. They work almost entirely on hire for customers who bring small quantities—generally 10 to 15 seers at a time, usually the former—for grinding into *ata*. The charge made by the *chakki* miller for grinding ranges from Re. 0|2|0 to Re. 0|8|0 per maund or on an average about Re. 0|4|0 with or without further weight deduction to represent losses in grinding. The amount of wheat ground by these *chakkis* ranges between 20 and 40 maunds per day. A 14" *chakki*, for example, is capable of a throughput of 2½ maunds per hour and an 18" one about 4 to 6 maunds. At a conservative estimate not less than 2 million tons are annually processed by these small mills.

The number of power driven *chakkis* is rapidly increasing. Returns show that there are now about 3,000 electrically driven *chakkis* as against 1,200 five years ago. This would appear to indicate that the habit of grinding wheat in the household is rapidly dying out especially in the urban areas and that there is scope for enterprising young men in setting up those *chakkis* and developing a local trade in *ata* with a relatively small amount of capital. A small *chakki* fitted with electric motor can be obtained for less than Rs. 300 and one fitted with an oil engine with a somewhat higher crushing capacity can be got for an initial outlay of Rs. 1,200 to Rs. 1,500.

When the stones are properly set they are capable of turning out other products, *e.g.*, *suji* and *rawa* although the practice at present is for nothing but *ata*

to be made by these *chakkis*. There seems, therefore, a need to devise some simple screening or sieving apparatus in order to increase the types of product turned out by these small mills.

There are about 80 large modern roller mills in the country with milling capacities ranging from 20 to 210 maunds per hour and an estimated potential capacity of nearly 2 million tons per annum which is about double the quantity of actual output at the present time. The largest mills are situated at the ports of Calcutta, Bombay and Karachi, each mill represents an investment of several lakhs of rupees. They are well equipped for turning out all types of products from high class superfine flour to second and third quality *ata* and bran. The bare cost of milling in these establishments per maund of wheat appears, on an average, to be about Re. 0|4|6. In many cases the only profit made by such mills particularly in Northern India is obtained by charging their customers for the bags as containers a relatively high price as compared with the cost price to the mill. This partly explains the apparent anomaly of certain products selling about as cheaply as wheat itself and on some occasions even at lower prices, but costs will obviously vary, other conditions being equal, according to the type of product turned out.

These mills put out a very large number of different qualities and brands of products. Their *atas* for example, may be described as No. 1, No. 1½, No. 2, No. 3, etc. The No. 1 of one mill may be altogether different from that of another and not itself consistent in quality from one period to another. It is probable that the multiplicity of qualities at present on the market has its origin in the exceptionally keen competition which exists in the flour trade. The roller mills feel compelled to adopt every conceivable device to bring their *ata* down to a competitive level with the *chakki* milled

article with the result that they are constantly in the market for the cheapest type of wheat available. They do not therefore, provide any incentive to cultivators or sellers to put on the market high quality produce.

It seems possible that if the roller mills could take steps to abolish excessive competition amongst themselves they could obtain a better price than at present for their various types of white flour (*maida*), including sizing flours and for their *suji*, *rawa* and bran in respect of which the *chakki* miller is not at present in a position to compete. As a first step in this direction it would be desirable that the roller mills as a whole, acting as an associated body, should come to some agreement regarding the minimum standard of quality to be observed in respect of flours designated No. 1, 2, 3, etc. Apart from this there seems scope for individual mills to develop still further the trade in high quality reliable products in small pre-packed, branded retail containers.

As regards the subsequent preparation of other products the baking of fermented bread in the form of loaves (*dabal roti*) seems to be confined mainly to the cities and larger towns. Machine-made bread is apparently only produced by one or two concerns in Calcutta and Bombay, the remainder is hand-made. One of the great difficulties in the production of this type of bread in India is the irregular supply of good pure yeast and there seems little doubt that the low quality of the average Indian loaf is in a large measure due to defective fermentation. The inferior grades of flour which are used—frequently in mixtures or blends mainly with the object of cheapening costs—by bakeries catering for the tea and coffee shops trade is also responsible for the indifferent quality of Indian bread.

The conditions under which this bread is baked are capable of considerable improvement and there is

evidently as yet no attempt made to regularise these or the hours of baking as in other countries, nor is a minimum weight of loaf anywhere prescribed in India. The price of a loaf therefore varies from one baker to another but the usual price for the bazaar made article is from Re. 0|0|9 to Re. 0|1|0 per loaf weighing about half a pound. The gross profit to the baker per sack of flour is apparently somewhere in the neighbourhood of Rs. 5 or 6.

Other cereal products are *sewayan* (vermicelli) and macaroni. The former is manufactured to quite a large extent in several towns in Northern India where the consumption is fairly high and in Bombay and Madras for sale in south India. The production and distribution of such products require to be further investigated with a view to organising the trade properly. If these were suitably packed and distributed there seems no reason why India should continue to import similar products from abroad. There is every reason in fact why the position might be reversed. It is perhaps significant that enterprising firms in the south of India by packing their product in a suitable container are able to send it to central and northern towns and sell in the neighbourhood of Re. 0|6|0 per lb. packet in competition with the local made product which is largely sold loose and in bulk.

(So far as macaroni is concerned in spite of the fact that India grows some of the finest macaroni wheats in the world there is apparently as yet only one small factory operating, and imports of macaroni from abroad continue to arrive. This seems to indicate the necessity for advertising and giving greater publicity to the Indian products. The possibility of building up a trade in macaroni, *sewayan* (vermicelli) and also *suji* and *rawa* (semolina) on the basis of a standard quality mark, both for the internal market and for export,

requires serious consideration. At the moment, however, the type of container used in packing several of these products compares very unfavourably with containers imported from abroad (*see* plate facing page 300) and requires to be considerably improved, not only to make them more attractive but also to preserve the flavour and quality of the article.

The wholesale distribution of cereal products is mainly operated on a commission basis. Different types of *maida*, *ata*, *etc.*, bear a brand or description up to the point at which they leave the wholesalers' hands but lose their identity after that stage and no description of quality applies to the products sold in most of the retail establishments. The trade in branded sealed packets is still at most infinitesimal. The retailer also mixes low quality with high quality produce in order to lower his selling price. It is therefore difficult to arrive at any average retail price or the margin of profit which exists between the wholesale and retail price of any cereal commodity.

There is a large body of consumers in India who are prepared to pay a good price for a good quality article and the safest method of approach at present would be for processors and manufacturers to develop and expand the trade in retail packets sealed and suitably branded with their trade description. Apart from that, as already referred to, much might be done by the retail trade themselves particularly in urban areas to introduce the practice of labelling their goods with a quality description and the daily selling price.

CHAPTER XI.—SEED.**A.—Quantity.**

The amount of seed wheat sown per acre varies greatly from province to province and from district to district within each province, or State, according to soil and climatic conditions, the time of sowing and the method employed. Late sowings generally necessitate a higher seed rate to ensure a satisfactory outturn and broadcasting is less economical of seed than drilling. Light soils generally require less seed than heavy soils. Where subsoil moisture is insufficient or below normal, the seed rate must be high. A lower seed rate is employed in fertile ground as tillering tends to fill in the gaps. On the other hand, where the life of the plant is comparatively short owing to early flowering, tillering is meagre and a higher seed rate is necessary. White ants are another factor which influence the quantity of seed sown and on this account in certain districts of the United Provinces an extra amount of seed has to be sown if the crop is to survive. The following table gives the average seed rate in some of the major areas and the estimated total requirements for seed. The variations within these areas are subsequently referred to.

Seed requirements.

Province or State.	Average wheat acreage 1930-31 to 1934-35.	Average seed rate per acre.	Average annual seed requirements.
	(000 omitted).	lb.	(tons).
Punjab (including States)	10,541	50	235,300
N. W. F. Province	991	50	22,100
Sind (including Khairpur State) ..	1,240	100	55,350
Delhi	42	82	1,600
Ajmer-Merwara	27	82	1,000
United Provinces (including Rampur State)	7,927	103	364,000
Bihar and Orissa	1,217	100	54,200
Burma	30	82	1,100
Bengal	146	82	5,400
Central Provinces and Berar (includ- ing States)	3,506	86	134,600
Bombay (including States)	2,323	82	85,000
Madras	16	80	6,000
Central India States	2,120	85	80,500
Rajputana States	1,405	82	51,400
Gwalior State	1,433	85	54,400
Hyderabad-Deccan	1,260	66	37,100
Baroda State	73	85	2,800
Other States	506	80	25,400
Grand Total ..	34,803*	..	1,217,250

*The Sind and Bombay areas have been based on two years' average and this accounts for the seeming discrepancy between this and the figure previously quoted, *viz.*, 34.4 million acres.

In the *Punjab* the rate varies from 32 lb. to 120 lb., per acre. In the case of unirrigated wheat in the Jullundur, Hoshiarpur and Ludhiana districts in the east it is about 41 lb., and in Dehra Ghazi Khan in the west the rate is 102 lb. In the Canal Colonies where irrigated conditions prevail the seed rate is 50 lb. per acre. In the south of the province the seed rate increases to 82 lb. per acre.

In *Patiala State* the seed rate varies from 30 to 49 lb. On well or canal irrigated soil it is either broadcasted or dropped into the furrow behind the plough. On irrigated land it is generally drilled and the seed rate is 40 lb. On an average about 7 per cent. of the entire crop of the Punjab and the neighbouring states is required for seed each year.

In the *United Provinces* the seed rate ranges in the north-west from 45—56 lb. in the Bijnor area, to 80—160 lb. in the Allahabad district in the east. Intermediate rates of sowing are found in the intervening tracts of Cawnpore, Mainpuri and Etawah as also in the Jhansi and Banda areas in the extreme south of the province. Between one-seventh and one-eighth of the annual outturn is used as seed.

In the *Central Provinces* the seed rate varies from 40 to 120 lb. per acre. In the Nagpur and Berar districts, where the three coultered seed drill (*tiffan*) is used, the seed rate is 40—50 lb. In the wheat zone proper the primitive sowing plough (*nari*) is used, and the seed rate varies between 100 and 120 lb. When sown broadcast the rate is 80 lb. to the acre. The low seed rate when the *tiffan* is used is due to the greater spacing and straight sowing, and generally the sowers are more efficient. With mixed sowings, e.g., wheat and gram, the former is seeded at the rate of 80 to 100 lb. per acre and the proportion of gram seed varies from 10 to 40 per cent according to the condition of the soil and the time of sowing. Normally the less favourable the seed bed for wheat the more gram is added to the mixture. The average annual seed requirement in this province amounts to between one-fifth and one-sixth of the total crop.

In *Bihar* the average seed rate is 100 lb. per acre and, on an average, more than one-ninth of the total outturn is needed for seed purposes each year. In Bombay the seed rate ranges according to the different tracts from 30 lb. for the red *durums* in the Carnatic to 100—120 lb. for the soft reds of Gujarat. The seed rate for *khaphi* (Emmer) an irrigated variety, is about 100 lbs. In the Bombay-Deccan the rate is 80 lb.

In *Hyderabad (Deccan)* the seed rate varies between 55 and 66 lb. Including about 10 per cent. for re-sowings and damage during store, the demand for seed wheat forms a little less than one-fourth of the local crop.

NOTE.—In Australia the average quantity of seed per acre, based on the period 1929-30 to 1933-34, was 59 lb. The seed rate in Canada ranges between 75 and 80 lb. per acre.

B.—Quality.

The amount of care exercised by the cultivator in cleaning his seed varies. In the Punjab and in parts of the United Provinces seed intended for sowing is often winnowed, picked over and sieved. In other localities, apparently, no special precautions are exercised to rid the wheat of impurities or admixtures. In Delhi province for instance, and in the surrounding tracts it is the practice to sow wheat from which the barley has not been eliminated. Barley is considered to be hardier than wheat and when a mixture of wheat and barley is sown the latter may survive conditions which are unfavourable for wheat. Retaining the barley in the seed is, therefore, regarded by the cultivator as a form of insurance against complete crop failure. Elsewhere the sowing of gram with wheat is commonly resorted to as a protection against rust attack. With the foregoing ideas of insurance against crop failure or with some vague—empirical, or customary—considerations in mind relating to the conservation of the soil, admixtures are intentionally sown in many areas. The usual mixtures, in the United Provinces for instance are (i) wheat and gram, (ii) wheat and barley, (iii) wheat, barley and gram, and (iv) wheat, barley, gram and peas. The mixture of oilseeds in wheat in varying proportions is a common feature all over the main wheat producing areas.

It is possible that although the practice may be reprehensible from a marketing standpoint there may be an element of fundamental soundness in mixed cultivation from a producer's point of view—especially over a series of good and bad years, but so far as can be ascertained, no scientific work has been done on this problem.

✓ Wheat stored in underground *kachcha* pits is nowhere favoured for the purpose of seed as the cultivators consider that it does not germinate properly. This is probably due to a certain amount of heating or fermentation which takes place particularly if the wheat is stored in a slightly damp condition as may often happen. Frequently the lining of *bhusa* customarily used is not a sufficient protection against subsoil seepage and a portion of the grain may be affected. While pit stored wheat may be satisfactory enough for general commercial purposes it is not so regarded for use as seed, and the cultivator always tries to avoid wheat which contains musty and discoloured grains showing signs of pit storage. There is no evidence, however, that he ever does in fact test the germination capacity of his seed before sowing and there is no official seed testing station to which he might send any of his seed to be examined and reported on for purity or germination.

C.—Sources of Supply.

The main sources of seed supply are five in number :—

- (i) The cultivator's own stocks.
- (ii) The landlord or *zamindar*.
- (iii) The village *baniya* or local tradesman and shopkeeper.
- (iv) The wholesale trader (*arhathiya*) in the larger markets.
- (v) The Department of Agriculture in the provinces and States (through the agency of Seed Farms or Seed Stores, Co-operative Commission Shops or similar channels).

Before describing the part played by each of the above agencies reference may appropriately be made at this juncture to the conditions under which seed is generally obtained or borrowed when the ryot's own supply runs short. These are two in number, apart from cash purchases or special credit terms which may be a matter of individual arrangement. Of the two, the first is known as *sawai*, in cash or kind, generally the latter, the second is called *deorhi*. The former means " $1\frac{1}{4}$ " and implies the return to the lender or creditor of the original quantity loaned plus one-fourth. As the currency of the loan is between six and seven months, i.e., October to March or April, the annual charge amounts to anything up to 50 per cent. Seed borrowed on the basis of *sawai* in kind is probably the most popular. Under the *sawai* in cash system the seed is valued in terms of cash at the time of borrowing and the amount settled is, in theory, repayable in cash at the next harvest with the usual one-fourth extra. It would appear, however, that cash *sawai* loans are in practice frequently repaid in kind. This is to the advantage of the lender or creditor as he eventually receives a larger quantity of seed for the price fixed since the value of wheat is almost invariably lower at harvest time than during the sowing period when the seed was obtained. Cash *sawai* therefore costs the borrower more than the first named method. In addition, however, to the natural differences which exist between harvest and sowing time values and which, as stated, operate against the seed borrower, these differences are further widened by the customary practice on the part of the lender to fix the price at the time of borrowing at about 4 annas per maund over current rates and to under-value the wheat by not less than 2 annas per maund when it is tendered in repayment. For example, with a current value of wheat in October-November say Rs. 3 per maund the grower would be debited with Rs. 3-4-0 plus 25 per cent as interest, i.e., Rs. 4-1-0 per maund altogether. On the basis of a normal expectation of harvest price, viz., Rs. 2-10-0 per maund the value fixed for repayment would be Rs. 2-8-0 so that wheat worth Rs. 4-1-0 has therefore to be repaid at Rs. 2-8-0 per maund, i.e., 62 per cent extra which is equivalent to say 125 per cent per annum.

The second condition, *deorhi* in kind, is not an uncommon form of agreement in parts of the United Provinces between the cultivator and private agencies such as other farmers and *zamindars*. It does not appear to be much in vogue elsewhere and is usually found where local conditions are backward. The *deorhi* system entails the repayment at harvest time of the original quantity of seed borrowed plus 50 per cent.

The *sawai* system prevalent in Northern India has a counterpart in the Central Provinces known as *sawai barhi*. The word "*barhi*" means literally a "share" and its operation is in the main the same as that of the *sawai* system. An adaptation of the *barhi* system was originated in 1926 by a well-known landlord of the Jubbulpore district by the name of Pande. His scheme which became known as the *P-Barhi* system provided for the recovery of the seed advanced by Government at the rate of 20 per cent. annually, i.e., 10 per cent. towards capital and the remainder to the Government. Two or three

years after the scheme started a further 10 per cent was added for the purpose of allocation to the *tahsil* agricultural associations for general agricultural improvement. A more detailed reference is made to this method of distributing seed later.

The greater proportion of the wheat used for seed is retained by the ryots themselves out of their own stocks and every effort is usually made to do this. A few years ago an investigation conducted under the Board of Economic Inquiry in the Punjab revealed that, on an average, about two-thirds of the villagers interrogated, kept their own seed. It was significant that the percentage in the larger surplus tracts was higher than in the deficit areas. In the Canal Colony zone around Lyallpur, for example, more than 83 per cent. kept their own seed. In the Ferozepore district the proportion fell to about 60 per cent while in the North Punjab (Attock) some 50 per cent. were found to keep their own seed. It is not possible to form an accurate estimate as regards the United Provinces. The average holding is probably smaller here than in the Punjab, and the proportion of cultivators who retain the whole of their seed supplies would appear not to exceed 50 per cent. Greater resort therefore has to be made to one of the other various sources. In Bihar the cultivators are reported to retain practically all the seed that they require. Any deficiency is apparently made up by borrowing from other cultivators on *sawai* terms. Most of the seed in the Central Provinces is of local origin and in areas of sparse cultivation growers retain all their seed requirements. In the dense wheat zone where wheat is the chief money crop it is estimated that about 40 per cent. habitually borrow their wheat seed from one or other of the sources mentioned earlier, approximately in the following proportions :—

60 per cent being obtained from *malguzars* or large landlords, 35 per cent. from other large cultivators, and only 5 per cent. from the village *baniya*. The customary terms are *deorhi* for the first year and *sawai* thereafter. Taking the province as a whole about 30 per cent of the growers appear to store their own seed plus a little extra for lending, 10 per cent store their own seed and have no surplus for lending and may occasionally have to borrow from a *malguzar* or seed union, 20 per cent keep sufficient seed for sowing but for unforeseen reasons utilise part of it and have to borrow 20 or 30 per cent of their requirements from the *malguzars* or large *kisan*, while the remaining 40 per cent retain no seed whatever.

In the Bombay Presidency only the cultivators in the cotton tracts of Gujerat and in the Carnatic retain their produce for seed. In other areas it was found that the proportion of those who relied on their own stocks for seed varied from 5 to 25 per cent. It is significant that at Nipad where there is a Plant Breeding Station working on wheat, 75 per cent of the local peasantry obtain their seed supply from the village shopkeepers. In Hyderabad (Deccan) and in many parts of Baroda growers part with most of their harvest and obtain seed at sowing time by resorting to the trader. In Bengal the majority of cultivators keep their own produce for seed purposes except that in times of crop failure seed has to be obtained on the best possible terms from traders in the nearest market. This also appears to be the practice in Burma and Madras.

The village *baniya* or trader is probably the second most important source of seed supply in India. It seems to be mostly the smaller growers who patronise this agency. It was also observed that wherever wheat was a relatively minor crop, *e.g.*, in the Deccan (Bombay, Hyderabad, etc.), the greater proportion of local seed requirements were acquired, for cash or credit, from the village *baniya*. The economic investigation of 1931, already referred to, showed that approximately 20 per cent of the cultivators in the Punjab obtained their seed from the local trader. The proportions varied from about 9 per cent in the Canal Colonies area to 17 per cent in Ferozepore and nearly 30 per cent. in the north of the province. It is not possible to localise the areas in the United Provinces in which the *baniya* is chiefly resorted to, as conditions vary from district to district. In the surplus areas of the west, conditions may be taken as approximating to those in the Punjab. In the Central Provinces, and in Central India generally, the *baniya* is not patronised by the ryot to any appreciable extent. In Bombay, however, and in the Deccan, the village trader is an important factor in the supply of seed. Enquiries at one village in the Ahmednagar district showed that 95 growers out of 100 get their seed from the *baniya*. In another village in the same area the proportion of seed borrowed from the *baniya* fell to about 50 per cent. At Lasalgaon, an important wheat market in the Deccan, the percentage was 75. These advances are usually on credit and the stipulation generally made by the trader is that the cultivator should sell his harvest through him.

The landlord or *zamindar* is another factor in the supply of seed. In the Punjab an investigation in 1931 showed that on an average about 7 per cent of the cultivators obtained their seed from this source. The proportion varied considerably from one district to another. In an important sector of the Canal Colony area it was about $2\frac{1}{2}$ per cent. In the east central district of Ferozepore it was more than 18 per cent while in the North Punjab (Attock) the percentage fell to about 3. No precise information is available regarding the part played by the *zamindar* in the distribution of seed in the United Provinces. Local conditions are probably even more variable than in the Punjab. From the evidence gathered during this survey a rough estimate would appear to place his share at 20 or 25 per cent. In the Central Provinces the *malguzar* is an important factor in the local distribution of seed in the dense wheat zone. In the other provinces and States the landlord does not appear to take any appreciable part in seed distribution.

Pakka or *kachcha arhatiyas* in the large assembling centres do not play a significant part in the distribution of seed except possibly where the market happens to be surrounded by an area of intense cultivation.

¹ *Department of Agriculture.*—The most reliable source of seed supply is one or other of the agencies controlled by the Departments of Agriculture in the various provinces. Arrangements for the distribution of seed vary according to local conditions and are described in detail later. The quantity of seed so distributed is only a fraction

of the total seed requirements of the country and is probably less than one per cent of the whole.

D.—Methods of Distribution.

(1) BY TRADERS.

The proportion of seed wheat distributed by traders is, as already mentioned, not very large except in the Deccan, notably the Bombay Presidency and Hyderabad State. The terms under which the seed is acquired have been fully described earlier and conform either to the *sawai* system, generally in kind, or the wheat may be bought outright for cash, which is rare. It may also happen that the value of the seed wheat is fixed at a mutually agreed price and entered by the trader (*baniya*) to the debit of the purchaser where the latter is a regular client or has an outstanding account with him.

(2) BY CO-OPERATIVE SOCIETIES.

The quantity of seed distributed through co-operative societies working independently is practically negligible. The majority of the societies are credit organisations which with possibly one or two rare exceptions do not participate in the actual handling of wheat. In some cases although the co-operative societies do not distribute seed, they lend funds to approved persons for its purchase. As far as can be ascertained only one or two societies actually advanced seed. Of these one is the Co-operative Agricultural Supply Society at Hardoi (United Provinces) and another the Co-operative Grain Sale Society, Shikarpur (Sind). The former distributed 840 maunds of seed wheat in 1936, while the latter handled 527 maunds in the same year. Both institutions show a significant decline in these activities as compared with 1934, when almost double the quantity was distributed. In Sind, finance of seed distribution is undertaken by the Sind Provincial Co-operative Bank. Formerly the seed itself was obtained from the Agricultural Department and handled by the Bank in question. This method of distribution did not prove a success as the seed became mixed owing to inexperienced handling and was infected with weevil. In future, therefore, the actual distribution of the seed will be effected by the Agricultural Department itself.

(3) BY AGRICULTURAL AND REVENUE DEPARTMENTS.

The channels or agencies used directly or indirectly may be as follows :—

- (a) Government farms and large estates.
- (b) Seed stores and depots.
- (c) Growers associations.
- (d) Registered commission agents.
- (e) *Taqavi* loans.

(a) *Government farms and large estates*.—During 1934-35 the work of seed distribution in the Punjab received a special stimulus from the personal interest taken by the Governor. A conference of officials and non-officials was convened to discuss ways and means of making each district self-sufficient as regards the production of improved seed. It was decided that the Court of Wards estates and other lands under Government control were to be used for the

multiplication of improved varieties of wheat seed. Accordingly arrangements were made with large *zamindars* for the production of improved strains subject to their outturns being purchased for seed, if required, under the new scheme. Special grants have been given to certain large estates on this specific understanding.

There are seven seed farms in the Punjab*. These and other departmental farms provided 21,925 maunds of pure seed in 1934-35 for multiplication. In addition to supplying a certain amount of seed direct to the cultivator their most important function is probably to form a link between the crop botanist's small experimental areas and the large grantee and Court of Wards estates from which the main seed supplies are obtained. The various seed farms in this province return a useful annual profit to Government. The net income in 1934-35 was Rs. 51,049.

During 1934-35 in Sind some 604 acres were put under wheat for seed purposes at Government farms and 4,060 acres by registered seed growers. The former yielded 4,150 maunds. A considerable proportion of the produce of the latter had, however, to be rejected as unfit for sowing, for various reasons, and only 13,258 maunds, mainly of the Punjab 8-A and Pusa 114 varieties were purchased by the Sind Provincial Co-operative Bank for distribution.

In the United Provinces there are 13 Seed and Demonstration farms apart from 8 research and 3 experimental farms. There were also in 1934-35 some 1,367 private farms worked under departmental supervision acting as centres of seed multiplication for improved varieties. Their growth is illustrated by the fact that in 1929 the number of these farms was 964. All are not devoted exclusively to wheat but the amount of wheat seed distributed far exceeds that of any other crop except sugar cane.

In the Central Provinces there are three Government farms and 6,046 private seed farms and unions. The total amount of seed distributed from these sources in 1934-35 was 196,286 maunds.

In Bombay there are 16 Government farms excluding 3 financed by the Imperial Council of Agricultural Research. The production of seed wheat is undertaken at one or two farms (*e.g.*, Jalgaon in East Khandesh) and forms a relatively minor part of the activities of these institutions. The actual seed distribution work is undertaken with the help of the Taluka Development Associations. A little less than 2,100 maunds of pure seed was distributed in 1934 mainly in East Khandesh. This is an infinitesimal fraction of the presidency's total seed requirements.

(b) *Seed stores and depots.*—These are a feature of the United Provinces. In 1934-35 the total amount of improved varieties distributed for seed was 182,838 maunds, representing approximately 2 per cent of the total provincial seed requirements. Contact between purchaser and distributing authority is direct and the methods governing the distribution are the same as would prevail

*Fateh, Shergarh, Risalewala, Sargodha, Sargodha (old area), Chillianwala and Vihari.

between the ryot and private agencies such as the *baniya* or *zamindar*, viz., *sawai* in kind, ordinary credit terms or cash payment. A very recent innovation enables *desi* or non-descript seed to be exchanged at the seed stores for pure improved varieties. Seed is also advanced free of interest to a group of selected cultivators or to a *zamindar* for distribution on the *sawai* system. After five years the quantity originally advanced by the Government is taken back and replaced with an equal quantity of fresh improved seed.

As a means of meeting the steadily increasing demand for pure seed the local seed stores appear to have reached their limit and the spread of improved varieties can only be accomplished by private or co-operative sources of supply. Every effort is now being made to try and create this machinery with, it is claimed, certain signs of success. There are six seed depots in the Punjab centred at the headquarters of the agricultural circles at Lyallpur, Gurdaspur, Hansi, Montgomery, Rawalpindi and Jullundur. These are stocked by purchases of seed out of their grants by the Deputy Director of Agriculture from Government seed farms and private estates. The seed is subsequently distributed through the registered commission agents described later. In 1934-35 over 101,200 maunds of seed wheat were thus disposed of. The loss on these depots in 1934-35 amounted to over Rs. 61,000 and should to some extent be set off against the profit shown by the seed farm. The loss is apparently related mainly to the cost of freight.

(c) *Growers' associations*.—The outstanding example of growers' associations existed till lately in the Central Provinces. In the dense production zone the Government farms used to supply seed on what is known as the *P-Barhi* system. The scheme provided for the loan of pure seed to seed unions of five or more cultivators for a period of 10 years at 20 per cent per annum. Payments were made in kind so that all might participate in the distribution of pedigree seed. The system has, however, not worked satisfactorily and the majority of the 500 seed unions are shortly to be closed down for the following reasons :—

Just after the scheme took shape in 1926, it was followed by a succession of three years of crop failures bringing about practically famine conditions. Repayments were suspended but when the time came to make recoveries, the ryots not only had no seed to return but had become deeply involved with money lenders. At this stage the position might have been reviewed by the Local Government and the lost seed written off or the cultivator given a further extension in which to make payment. Instead, orders were issued demanding that dues should be paid in cash on the basis of the original value of the loan and not in kind as originally stipulated. By this time (1929-30) the depression had set in, the price of grain had fallen and it was widely held by the debtors that the repayment demanded was unduly harsh. At the end of 1935 the number of growers' associations including the 500 referred to above was 1,796. In the Punjab also there are a few seed producing societies especially in the Jullundhur district.

(d) *Registered commission agents*.—This is a method employed, as far as can be ascertained, only in the Punjab. Towards the end of 1935 there were 625 of such distributive agencies. A copy of the terms of agreement executed between the commission agents and the Agricultural Department is given in Appendix LIV the salient features being :—

- (i) that the seed is to be sold at a rate fixed by the authorities (this is normally about 4 annas per maund above the market rate for ordinary wheat),
- (ii) the rate of the agents' remuneration is 2 annas per maund,

A surety bond for an appropriate amount is also taken from every agent. The progress achieved by this method of distribution appears to have been remarkable. In 1932-33 the seed sold through this channel was 25,375 maunds. In the following year 88,150 maunds were reported as sold to growers while in 1934-35 the turnover had risen to 101,200 maunds representing about 1.75 per cent. of the total seed requirements of the province. The amount of seed which actually finds its way to the ryot by this agency is, however, open to question. It was asserted by growers and merchants who were interrogated during the course of this survey that a proportion of the seed issued by the Agricultural Department to these commission agents was not sold to growers but disposed of to the trade or in other ways. The weakness of the system seems to lie in the fact that the agent is responsible to the Agricultural Department only for the value of the wheat handed over to him at the price fixed by authority and so long as the full value is recovered, no check appears to be made in regard to the manner in which the wheat is disposed of. The system, however, appears to have much to commend it and it is possible that a tightening up of supervision might help in the wider and speedier extension of improved wheats.

(e) *Taqavi loans*.—*Taqavi* loans for seed under the Agricultural Loans Act of 1884 are granted in times of scarcity only. These bear interest usually at $6\frac{1}{4}$ per cent per annum.

E.—Control of Supply of Improved Seed.

In the *Punjab* a scheme is in force for the maintenance of the purity of seed of approved wheat varieties and for keeping them smut-free. A certain amount of pure, smut-free seed of each improved variety is annually produced at the Risalewala Seed Farm (near Lyallpur) under the supervision of the Cerealists and from there distributed to Government seed farms and private large-scale seed growers in all parts of the province for further multiplication. In the following season the seed so obtained is bought by the department for distribution to the growers in general through departmental seed depots. The raising of this pure, smut-free seed at Risalewala is done in three stages, the start always being from a small nucleus of absolutely pure seed. Roguing of the standing crops and hot-water anti-smut treatment are the foundation of this scheme in all

the stages and under it, a supply of 1,000 to 1,200 maunds pure, smut-free seed of 8-A wheat was produced in each of the three years 1930-31 to 1932-33, and some 3,000 to 3,300 maunds of 8-A, 9D, C518 and C591 wheats in each year of the triennium 1933-34 to 1935-36 for use as foundation pedigree seed. All are white wheats of the *sharbati* class (*Triticum vulgare*).

For the rapid multiplication of the newly evolved types advantage is being taken of the widely different climatic conditions in the Lahaul valley in the Kangra district where wheat is sown in May and harvested in October as contrasted with the growing season of November to April in the plains. It will thus apparently be possible to have two crops in one year which will shorten the period usually required for the evolution of improved types by cross breeding.

In Sind the systematic organisation for the multiplication of improved seeds was started under the Department of Agriculture in 1931-32. The scheme consists of five stages and is based upon ultimate units of 50,000 acres of which there are eleven. The programme of each unit is given below :—

Stage.		Area (Acres).	Location.
1. Seed patch	.. ..	5	Agricultural Research Station, Sakrand.
2. Increase block	.. ..	50	Government Auxiliary Farms.
3. Field scale planting	.. ..	500	"A" class registered seed growers.
4. Village group	.. ..	5,000	"B" class registered seed growers
5. District	.. ..	50,000	General cultivation.

Each stage is fed from the preceding one. The first two stages are under the direct supervision of the Department of Agriculture and seed is thoroughly examined for purity. The 3rd and 4th stages of the scheme involve the enlistment of enlightened growers to grow pure seed for the Department. The produce of the fourth stage was originally intended to be distributed through the Co-operative Societies and Sind Central Co-operative Bank, but the system has not worked satisfactorily for the reasons already given and is now being dealt with by the Agricultural Department in Sind direct.

There are four varieties under propagation namely C.Ph.47, A.T.38, Punjab 8-A and Pusa 114. All are white wheats (*Triticum vulgare*) and most would be classified by the trade as *sharbati*.

In the *United Provinces* pure seed of improved varieties is almost exclusively supplied by the seed stores of the Department of Agriculture. Endeavours are made to maintain purity by the following means. The seed store inspectors visit the fields of those cultivators who are known to be using departmental seed to ensure that it is sown unmixed and that when the ears have appeared the crop is rogued. When the produce is brought to the seed store pending distribution, all foreign matter is eliminated as far as possible by and through cleaning and sieving. As the seed deteriorates the seed stores arrange for fresh supplies from the Government farms in replacement of

the old stock. Grants are made to selected cultivators for the supply of pure seed in lieu of which the grantees undertake to supply fixed quantities of pure seed for a number of years, generally five. Similarly tube well owners are also required to grow and deliver a stipulated quantity of improved seed in lieu of the supervision charges over the tube wells. The Department of Agriculture deals only in improved varieties of which the main types are Cawnpore 13, Pusa 4, Pusa 12, Pusa 54, Pusa 52 and Muzaffarnagar. All are white wheats (*Triticum vulgare*), the three last named being soft in texture.

In Bihar the Department of Agriculture has spread the cultivation of Pusa 52 which is liked as much by the planters in North Bihar as by the smaller cultivators elsewhere in the province. This is the predominant improved variety in Bihar.

In Bengal improved varieties are also grown in small quantities on Departmental farms and distributed direct through the Agricultural officers. The improved wheats so distributed in small quantities are Pusa Nos. 4 and 12.

In the Central Provinces the purity of seed is one of the primary objects aimed by the Government seed farms. Contrary to the evidence afforded by cultivators in the Punjab that it pays to sow good pure seed, it would seem that in the Central Provinces growers have developed an apathy towards maintaining the purity of the seed supplied to them on account of the low prices which have prevailed in recent years. The extra cost of roguing, it is maintained, is not compensated by better cash returns. There are three Government seed farms in the dense production zone and the seed distributed is mainly of the white *vulgare* types A115, A.O.88, A113, all originally obtained from crosses between *mundia* and *khapli*, and A.O.90, a selection from *Lal-kusarwal*, an old Punjab variety. The number of selected private seed farms is increasing and was 6,041 in 1935.

In Bombay the Agricultural Department distributes small quantities of improved varieties, but the success of these efforts has not so far been great. This may be attributable to lack of funds and suitable sale organisations such as exist for cotton. In 1934-35 the official estimates of the area under improved varieties was only 8,346 acres, including 6,300 acres under *bansi* (*durum*) No. 224 and 1,269 acres under Pusa 4 (*Triticum vulgare*), a proportion of rather less than half per cent. of the total acreage under wheat in the Presidency.

In Patiala State the methods of seed conservation and distribution deserve special mention. This State operates one seed farm and demonstration plot, and with the object of multiplying sound pedigree seed a large number of land owners working 50 acres or more have been registered as seed growers and provided by the State with a farm manager for the better supervision of their farms. Pure seed was originally issued from the parent seed farm to these growers free of all interest under the stipulation that an equal quantity should be returned to the agricultural authorities at harvest. The growers' crop is under constant supervision not only by the farm manager but by the Agricultural Departments' own inspectors who

inspect the area sown with pure seed, at least twice, during the growing period. At harvest the threshed grain is examined by the Agricultural Inspectors and if it conforms to the quality of the pure seed originally sown, it is set apart for storage in tin-plate or galvanised iron bins or containers which are provided by the state for this special purpose. These containers vary in size according to requirements and the smallest is usually the ubiquitous kerosine tin fitted with a lid or cover. As soon as the seed has been approved and stored in the presence of the farm manager or Agricultural Inspector, the containers are sealed and are not allowed to be opened until required at sowing time and then only in the presence of the inspector or manager. As a safeguard a deposit of Rs. 100 is taken from each registered grower. Any infringement of this rule is punishable with a penalty of Rs. 25 (which is deducted from the deposit) for each seal broken.

The distribution of the seed is effected on credit and free of interest in the presence of the Agricultural Inspector who notes the name of the cultivator taking it, so that the results of his sowing may be later examined.

F.—Research and Plant Breeding Institutions.

Since the opening of the Botanical section of the Imperial Agricultural Research Institute at Pusa in 1905 the work of wheat improvement has occupied a prominent place in the programme of research. Realising the importance of wheat in Indian agricultural economy the first Director Mr. A. Howard aided by his wife commenced their pioneer work on the improvement of Indian wheats. The earlier work, down to 1924, consisted mainly of the collection and classification of wheats from different parts of India and the isolation of pure types from the various local mixtures. By 1924 out of the numerous varieties three strains, *viz.*, Pusa 4, 12 and Punjab 11, were propagated widely throughout the United Provinces and the Punjab. Another strain, Pusa 100, did well in parts of the Central Provinces.

Later work, from 1924 onwards, has been responsible for the number being expanded and there are to-day 7 popular types adapted to a variety of conditions in different parts of Northern India, *viz.*, Pusa 4, 12, 52, 80-5, 101, 111 and 114. With the exception of Pusa 52, the predominant improved type in Bihar, the remainder are hard white or amber wheats (*Triticum vulgare*). Pusa 111, wheu subjected to milling and baking tests in England, was found to be equivalent in value to good Manitoba wheat. Among the newer wheats, Pusa 114 has been successful in Sind owing to its rust resistant qualities.

Three new wheats, Pusa 120, 125 and 165 bred from crosses between the Australian variety, Federation and some of the established Pusa wheats, are now undergoing extensive trials at various farms in Northern India.

One of the greatest sources of damage to the wheat crop in India is rust, and the breeding of wheats resistant to rust is receiving special attention. This work is being carried on at the Imperial

Agricultural Research Institute, Delhi, and at a sub-station in Simla in collaboration with Professor K. C. Mehta.

Since 1907 when the botanical section of the Punjab Agricultural Department was created, plant breeding work on wheat has been in progress at Lyallpur. In the earlier years this work consisted in isolating pure types from the indigenous mixtures and then selecting out of them the best for distribution to farmers. But possibilities of this method having been exhausted, the evolution of improved types is now being done by cross-breeding.

Some of the more important of the various improved strains that have been found successful and issued for general cultivation are No. 11, No. 8-A, No. 9-D and the two newest crosses C-518 and C-591. The first named type was a soft white wheat and by 1924-25 commanded an area of about 1 million acres in the Punjab. (See Chapter 1). No. 8-A was first given out for general distribution in 1919. This is a hard white wheat and it has gradually ousted the earlier No. 11. In 1934-35 probably at least 3 million acres were reported to be sown with this type, representing nearly one-half of the total area under improved varieties in India. The two newest types, C-518 and C-591 were issued in 1933-34 for the first time. Both are hard well-filled amber coloured wheats. The former is well adapted to rich irrigated soils. The latter is adapted to a somewhat wider range of conditions and, in addition to doing well in the Punjab, has proved to be the most promising of a large number of strains tested in Rajputana and Central India by the Institute of Plant Industry, Indore.

The Agricultural Department in Sind has done a considerable amount of research on wheat improvement during the last 12 years. Rust has also received special attention. The aim of the Department is to obtain high yielding and superior strains by means of botanical selection from local types and also to introduce and acclimatise suitable strains from outside the province. The first stage of the seed multiplication scheme, to which reference has already been made, is now in hand at the Agricultural Research Station, Sakrand. Six auxiliary farms are dealing with four main types of improved strains for propagation in Sind. These are Pusa 114, Punjab 8-A and two local wheats, viz., C.Ph.47 and A.T.38. All are white wheats of the *sharbat* type.

The United Provinces has its Research Laboratory and farms situated at Nawabganj just outside Cawnpore. Improved strains are obtained here both by selection and by hybridization. Varieties grown in other provinces are also tried out in these farms for examining their suitability to local conditions and, if found satisfactory, the seed is multiplied at Government farms and distributed to private farms. One of the most popular strains bred at the Botanical Research Farm, Cawnpore, is C-13 a hard amber coloured wheat.

The introduction of improved strains of wheat in Rajputana and Central India has been given considerable attention at the Institute of Plant Industry, Indore. With a view to determining the suitability of a large number of various types of wheat to conditions in

this part of India exhaustive tests have been made during the past three or four years. Malwa is predominantly a *durum* wheat tract, and the grains of the Pusa, Punjab and Central Provinces wheats do not do as well as the local *durums* but Punjab 8-A, 9-D, C-499 and C-591 have shown promise on good lands. C-591 proved to be the best of the strains tested on account of its high quality. Cawnpore 13 also did well.

There is an Agricultural Research Institute at Nagpur (Central Provinces) and two experimental stations at Hoshangabad and Jubbulpore. At present wheat research is centred only at Nagpur. Rust is the chief problem of the north where wheat is mostly grown. The aim of the plant breeding at Nagpur has been to evolve a high yielding and rust-resistant strain. In the years 1912-18 much useful work was done at Hoshangabad. It is claimed that *sharbati* wheats Nos. A-113, A-112 and A-090 stand out in years of rust, although in normal seasons they are not considered as prolific as the local or *desi* types. It is felt in the Central Provinces that the local black soil areas have not derived much benefit from the numerous varieties that have been produced at Pusa and Lyallpur, most of which are specially adapted to alluvial soils and belong to the sub-species *Triticum vulgare* whereas the local varieties are largely *Triticum durum*. It is suggested by the local Government that the Imperial Department of Agriculture should establish a sub-station for plant breeding work in the North Central Provinces.

The Department of Agriculture, Bombay, has one wheat breeding station at Nipad in Nasik district. The aim of this institute is to breed high yielding rust-resistant and early types of wheat with due regard to lustre and plumpness of the grain. Up to the present three improved varieties of wheat have been given out for general cultivation, viz., *bansi* (*durum*) strains Nos. 224 and 168 and *bansi palli* No. 808 (cross between *durum* and the *Emmer khapli*). Pusa 4 is also imported from Pusa and distributed locally.

Work in the Madras Presidency has been confined to an examination at the Research stations at Coimbatore, Nandyal and Hagari of Pusa strains Nos. 4, 12, 52, 010/5, 101, 11 and 114. All were found unsuitable for local conditions. The wheat crop is not regarded as of sufficient importance in this province to call for special research work.

The Agricultural Department, Burma, has an experimental farm at Pidun village in Sagaing district to conduct experiments and to produce pure seed. Exotic wheats, specially Pusa varieties have been tried but found unsuitable. Selected seeds of the "*durum*" type obtained by pure line method have been given out for distribution but on account of financial stringency the work on this farm has now been discontinued. The Shan States have a farm at Tounggyi which was formerly located at Kawngwe. The following wheats have been multiplied in this farm and distributed to cultivators, viz., Pusa 4, 12, 52 and the Australian type Federation.

INTER-CHAPTER ELEVEN.

The average amount of seed sown in different districts varies from 50 to over 100 lb. per acre and altogether about 1½ million tons or approximately one-eighth of the whole crop is used as seed.

Most of the cultivators appear to sow seed of their own growing but it is difficult to generalise. For example, in the Canal Colony zone around Lyallpur more than 80 per cent. of the growers use their own seed but in the Bombay Presidency the practice is to buy seed and only the cultivators in the cotton growing tracts of Gujerat and the Carnatic appear to retain their own produce.

When it is necessary for the cultivator to obtain seed from outside sources this is generally done on *sawai* terms which involve a repayment either in cash or kind of 25 per cent more than the amount borrowed. Reckoned on the short period outstanding this normally represents a rate of interest of 50 per cent. per annum. When the loan is repayable in terms of cash, however, the unfortunate borrower having taken the loan when values are high is under the necessity to repay at harvest time when values are low. The calculated interest in some cases then works out at the exorbitant rate of 125 per cent. The *sawai* system is not, however, confined to the trade. In the Central Provinces the local Government since 1926 provide loans to growers' associations on the *P-Barhi* system which originally involved a repayment in kind of 20 per cent per annum, but later was made repayable in cash. The system was not only onerous particularly when working on a cash basis but was unsuccessful in maintaining the purity of the seed and the operations of these growers' associations are being brought to a close.

The quality of seed is important. Cultivators generally take particular care in storing their own seed

which they intend to sow. The quality of supplies obtained from the *baniya* and other merchants often leaves much to be desired, especially when the wheat has been stored in *kachcha* pits.

There is no "Seeds" Act in India requiring sellers to give any kind of guarantee or particulars regarding the quality of seed sold and there is no official seed testing station where cultivators might have their seed wheat tested for purity and germination. Buyers generally get their seed locally and there is no special body of seed merchants engaged in trading between different districts. At present the only reliable agency for obtaining improved seed, true to type, from outside sources is the Agricultural Department of the Province or State.

The methods employed for the propagation and distribution of improved types vary from one province to another.

" In Sind the Agricultural Department begins with a seed patch of 5 acres and works through an increase block of 50 acres, thereafter through A class registered seed growers for field scale planting and subsequently B class registered seed growers constituting a village group of about 5,000 acres and eventually to general cultivation in the district covering about 50,000 acres.

In the United Provinces grants are made to selected cultivators for the supply of pure seed and at the same time tube well owners are allowed to grow and deliver a stipulated quantity of improved wheat in lieu of the supervision charges over the tube wells. Recently the Department has introduced a policy of exchanging improved seed for an equal quantity of ordinary wheat through its seed stores.

The Punjab system of distribution through registered commission agents appears to have something to commend it. There are, however, definite weaknesses

in the scheme in so far as at present the rate of commission seems high and no check appears to be made to ensure that the improved seed is passed on to the cultivator and actually sown by him. If this could be combined with the system in Patiala whereby the seed is collected and issued in sealed containers—frequently kerosene tins—the system would be greatly improved. Agricultural Departments as well as devoting their energies to the production of improved types should follow up their distribution. For example, in 1933-34, owing to the floods in that year in Delhi province, more than 9,850 maunds of pure Punjab 8-A wheat were imported and distributed to cultivators. This should have been sufficient to seed an equal number of acres. In actual fact a survey made in the following year showed that there were at most only 3,200 acres of 8-A in the province. The quantity which was not seeded was utilised for home consumption probably because of the low rate of interest at which the seed was obtained from the Government as compared with the cost of borrowing from the *baniya*.

Where the system of registered commission agents is employed it would appear to be desirable that the pure seed produced under the supervision of the Agricultural Department should be issued in sealed containers and that the departmental officers should take an interest in seeing that this grain is actually received by the cultivators and used for sowing.

In order to popularise the use of improved types by the cultivator it seems desirable that some system should be introduced whereby he may purchase through the commission agents his requirements in kind. At the present moment the commission agents are required to refund, when called upon, the cash value of the seed issued by the Department. It would be much better if, as in the United Provinces, payment could be accepted in kind and that the amount so paid should cover interest

(if any) and the commission payable to the agent. Arrangements would, of course, have to be made by the Department subsequently for disposing of the ordinary wheat received in payment, through commercial channels in the large wholesale markets. "

Research and plant breeding work has been largely devoted to producing improved types of white wheat (*T. vulgare*) and so far not much attention has been paid (except in Bombay) to the development of varieties of *durum* wheat. It is expected, however, that the Imperial Council of Agricultural Research will soon be in a position to arrange for a substation to be opened in the black soil tract of the Central Provinces where work of this kind could be done.

The attention of the plant breeders in India has been largely devoted to producing hard, strong white wheats suitable for milling. More lately their work has been concentrated on trying to produce rust-resistant types. The cultivators in some parts appear to believe that the sowing of a mixture of wheat and gram is a kind of protection against rust attack. The practice at any rate has a beneficial effect on the soil and acts as an insurance against complete crop failure. Similarly on dry lands where there is a danger of failure of the wheat crop, the growers are in the habit of sowing a mixture of wheat and barley or gram as a form of insurance against a total loss of crop.

From a marketing point of view the admixture of barley with wheat is reprehensible. This does not apply in the case of gram, however, which may be harvested separately or can in any case be easily separated from the wheat subsequently on the farm or in the market. There is apparently occasion for some scientific work being done on crop mixtures to provide the cultivator with a better alternative than barley for sowing with his wheat, particularly on *barani* lands.

CHAPTER XII.—WEIGHTS AND MEASURES AND UNITS OF SALE.

It seems hardly necessary to stress the desirability of standardising weights and measures. It is generally accepted that the many different methods of weighing and systems of weights and measures in vogue lend themselves to dishonest practices by the unscrupulous. This is, however, a relatively unimportant aspect of the problem. It is not as yet fully realised what a great handicap the present system imposes on the development of organised trading. Any merchant anxious to carry on business in different parts of the country finds himself hampered and his ordinary day to day labours very much increased by having to calculate buying and selling rates on the basis of various units of weights and measures. The great difficulty of getting readily comparable prices has already been referred to.

As long ago as 1913, the Government of India appointed a committee to investigate the subject. The most important recommendation of the committee was that the maund of 82-2/7 pounds should be declared the standard weight for India but not for Burma where conditions are rather different. The war intervened and the recommendations of the committee were not considered until 1922 when the Government of India decided to leave to the local Governments to take such action as the latter thought advisable in regard to standardising weights and measures. As a result some local Governments have enacted legislation for the standardisation of weights and measures, *e.g.*, the Central Provinces, Coorg and Bombay (see further note on page 345).

In 1928 the Royal Commission on Agriculture recommended that the Government of India should again undertake an investigation of the subject observing that “the only hope of advance appears to us to lie in action within the limits of each province. . . . it is desirable that no province should undertake legislation which might embarrass an adjacent province or at some subsequent stage render all-India legislation impracticable”.*

A.—Weights and measures in current use.

(1) WEIGHTS.

The various systems of weights and measures in use differ, sometimes very greatly, even within a small area. (See plate on opposite page.) The most common weight obtaining throughout the country is the maund of 82-2/7 lb.† This is known sometimes as the railway maund or the Bengal maund and is used on all the railways as well as at the ports and, in a fairly general way, in most of the larger trade centres upcountry. It is common in rural areas in the eastern

*P. 379—Report of the Royal Commission on Agriculture.

†The sub-multiple weights of the standard maund are the tola, the *chhatank* and the seer, as follows :—

1 Tola	= .4114 oz. (180 grains, i.e., the weight of a rupee).
5 Tolas	= 1 <i>Chhatank</i> .
16 <i>Chhatanks</i>	= 1 Seer (2.057 lb.).
40 Seers	1 Maund (82.2857 lb.).



DIFFERENT WEIGHTS

DIFFERENT MEASURES



A FEW OF THE WEIGHTS, MEASURES AND SCALES USED IN INDIA.

(Collected by the Marketing Staff in the United Provinces and photographed at the Industrial and Agricultural Exhibition, Lucknow.)

Facing page 341.]



THE AMRITSAR PRODUCE EXCHANGE LTD —TRADING PIT.

half of the Punjab, round about Delhi, in the western districts of the United Provinces and, since the enforcement of the Bombay Weights and Measures Act in 1936 in all the markets in that presidency and Sind.

The situation in the different provinces is described in some detail in the report of the 1913 committee. Since then the position has remained substantially unchanged. Outside the Bombay Presidency, for the purpose of the present survey, therefore, it will be sufficient to refer briefly to a few of the more glaring divergencies between the weights and measures in common use throughout the country. For example, the weight of the so-called *kachcha* or non-standard seer in the Punjab ranges from 31 tolas in Hoshiarpur to 102 tolas in Dera Ghazi Khan. It is stated in the report on the marketing of wheat in that province, "that the weight of the *kachcha* seer varies not only as between districts but also from village to village in the same district. Each village has thus got its own weights, and these weights often vary even in the same village".

Conditions in other parts of the country are perhaps even worse than in the Punjab. For instance, the weights in many of the more remote rural areas of North Bihar and the eastern districts of the United Provinces are based on "Gorakhpuri" pice, a copper coin deriving its name from Gorakhpur, both a town and district, in the north east of the United Provinces, valued at 3 pies or one-fourth of an anna, the actual weight of which was found to vary from .71 tolas to 1.41 tolas in 29 instances tested by the Marketing Officer, Bihar. The current silver rupee is also a measure of weight. The matter is further complicated as the *kachcha* seer in Bihar villages varies from 11 to 16 *gandas* of four pice each, and it is stated in that province's report that "*gandas* are mostly made of pieces of stones and are often found to be made of bricks, wood and pieces of iron". Great differences also occur between the weights of the seer in Bihar and Orissa. These range from 48 tolas in certain villages to 105 tolas in Cuttack. At Rajgir the weights range within the area of the town itself from 80 to 84 tolas.

In the United Provinces conditions are equally chaotic. The maund is everywhere divided into 40 seers but the number of tolas making the seer is highly variable. The only redeeming feature in this chaos is the weight of the tola which is always standard, *i.e.*, 180 grains or the weight of a rupee. At Moradabad, Chandausi and Bareilly 100 tolas make a seer, and the local seer is 2.5714 lb. and the maund 102.8571 lb. instead of the standard 82.2857 lb. At Muzaffarnagar and Saharanpur the local seers are of 88 and 86 tolas respectively and the maunds, therefore, of 90.5142 and 88.4571 lb.

The variation in villages is still greater and more confusing. In some places, *e.g.*, in Saharanpur district the seer is even made up of fractions of a tola—86-6/16. Such a seer is expressed as the weight of 86 rupees and 6 annas, the fractions being expressed in annas. Not only do the village weights differ from the weights used in the neighbouring market towns but in many places so-called *kachcha* weights are used. A *kachcha* seer is usually half of whatever unit may be used as the local market seer.

In the Central Provinces the majority of the "*gunj*" are under the control of local bodies. In Berar a number are regulated cotton markets and the standard maund of 82-2/7 lb. and its sub-multiples are the common units of weight. Measures are, however, not so standardised and vary considerably.

Prior to the introduction of the Bombay Weights and Measures Act, 1932, defining the standard seer as of 80 tolas, the seer of Bombay City was of 28 tolas, that of Poona 76 tolas while the Dharwar seer weighed only 20 tolas. In the north of the presidency the Ahmedabad seer was 40 tolas and at Surat 37 tolas made a seer. The maund in Sind ranged from 40 at Karachi to 41½ seers at Sukkur. At Shikarpur 41½ seers made the local maund and at Jacobabad 41 seers.

Most of the weights used in Northern India and particularly those in the United Provinces are manufactured in the foundries of Agra and Cawnpore. Weights made in Agra are also found in Central India and Bombay. The standard maund and its sub-units down to the *paseri* (5 seers) are either truncated cones or rectangular in shape. The weights of most denominations are made of cast iron and are stamped with the unit they represent.

(2) MEASURES.

The measures used in the different parts of India are multitudinous both as regards names and capacities. As a general rule the tendency in the wholesale trade to use measures instead of weights is greater in Southern India than in the north. In all the large surplus wheat producing areas and at the major ports weights are invariably used by the wholesale trade. One of the drawbacks of the measure system is that a measure full of grain cannot be expressed in definite terms of weight as the latter varies according to the specific gravity of the grain. A measure of rice, for example, is a different weight than the same measure of wheat or any other commodity.

The practice in regard to what constitutes a full measure varies. In the Central Provinces for example in markets such as Raipur the measure is "struck" level with the top. In Bombay Presidency on the other hand a "heaped" measure is customary. It is interesting to notice that the Bombay Weights and Measures Act, 1932, originally laid down that the new standard measure should be "struck" and not heaped as formerly. In deference to trade opinion which strongly held to the old system the rules were altered so that the heaped measure still prevails.

In the Punjab probably the most common measure is the *topa* the capacity of which varies from roughly 1 seer 10 *chhatanks* in the Gujranwala district to a calculated weight of 3 maunds 33½ seers for wheat in Kangra. In the south of the province in Muzaffargarh, the *topa* holds from 4 to 5 seers of wheat.

In former years measures of a convenient size, generally not more than 2 maunds, were in common use on the threshing floors of the west United Provinces for the purpose of making only a rough estimate of the produce harvested. These measures were made by

the village potter from baked clay*. In the south and east of the province, e.g., in the districts of Jhansi, Basti, Gorakhpur and also in the northern district of Naini Tal measures are still commonly used. It may be observed that at Haldwani measures are used only for purchases from cultivator-sellers, while at Nawgarh they are employed both for buying and selling to the villagers. This is possibly significant in indicating that the scope for malpractices is greater and deception easier with measures than with weights. These measures pass under a large number of different names. The *paili* and *mani* are probably the two most common. The former holds about 10 seers of wheat and the latter 5 maunds as in Bundelkhand in the south of the province.

In Bihar, in the villages of Chota Nagpur and Santhal Parganas the common measure is the *paila* of capacities varying from one seer down to one *chhatank*, either standard or local.

In the Central Provinces the primary unit of measure is the *paili* which is known as *pat*, *chouthia*, *barhaya* and *kangan* in different districts. The integral multiple measure of the *paili* is the *kuro* or *katha*. The *katha* is used in Raipur and Drug districts, and the *kuro* in the rest of the province. The *katha* and *kuro* are equivalent to 4 and 8 *pailis* respectively. The volume of the *paili* differs in different districts. For example, 100 tolas is the weight of a *paili* of wheat in the Nagpur, Raipur, Chhindwara, Damoh and Saugor districts; 90 tolas in Betul and part of the Hoshangabad district; 80 tolas in the Jubbulpur *barhaya* and the Khandwa *kangan*; 320 and 160 tolas in the Akola and Buldana districts respectively. The "*mani*, *chowki*, *maund*, and *khandy*" are the higher multiples of the "*kuro*, *katha*, *kangan* or *paili*" but are not "measures" in the true sense. The *mani* is used in the Saugor, Betul and Hoshangabad districts, the *chowki* in the Khandwa district, the *maund* in the districts of Berar, and the *khandy* in the rest of the province. Whilst the *khandy* is equivalent to 20 *kuros* or *kathas*, the *mani* may be 24, 32, 40 or 48 *kuros*. In the Betul and Hoshangabad districts the *mani* equals 24 *kuros*. The *khandy* may be 32 *kuros* in the Narsingpur and Gadarwara tahsils, but rises to 48 in the Seoni-Malwa and Hardai tahsils. The Damoh *mani* is one of 48 *kuros* and that of Saugor 40 *kuros*. The *chowki* of Khandwa is equal to 4 *kangans*, and the *maund* of Berar varies from 12 *pailis* to 16 *pailis* in the different towns.

In Central India the *mani* of Indore is 6 standard or Bengal maunds, as it is called locally, of 82-2/7 lb.

Measuring, as already stated, is the prevailing system in Bombay, in the Deccan generally and further south. In Bombay the capacity of the Dharwar measure is roughly 150 tolas—depending on the type of grain—while at Poona it is 100 tolas. In Gujarat, on the other hand, in the north of the presidency no measures at all are

*These vessels are still made but are used for the collection of the juice obtained from sugar cane crushed by bullock driven cane crushers and apparently derived their origin from a prejudice which existed against the use of a scale on the threshing floor. This belief has now died out and with it has disappeared the custom of measuring wheat.

ordinarily used and the large wholesale trade of Bombay city is also conducted on weights alone although retail transactions are very frequently based on measures. The new measures laid down in the Bombay Weights and Measures Act, 1932, are as follows :—

1 Chatak	..	..	..	= $\frac{1}{16}$ seer (standard).
1 Adapao	..	..	..	= $\frac{1}{8}$..
1 Paoseer	..	..	..	= $\frac{1}{4}$..
1 Adholi	..	..	..	= 2 seers.
1 Paili	..	..	..	= 4 ..
1 Maund	..	..	..	= 16 Pailis.
1 Map	..	..	..	= 2 Maunds.

Dry measures of capacity are tested with water or rapeseed. The working of the machinery created by the Act is described later.

With the exception of the markets of Hyderabad, Secunderabad, Nizamabad, Jalna and Aurangabad, Lahir and Bidar, where weights are used, almost all the other main centres of trade in Hyderabad State use measures. Wheat is always measured for example, in Gulbarga, Raichur and Osmanabad. The most common measure is the *paili* which is equal to about 4 seers, 16 *pailis* being equal to 1 maund. These measures differ from place to place and those in use in the same market are never exactly uniform.

In Madras, wheat is always retailed by the measure. The Madras measure holds roughly $3\frac{1}{2}$ lb. In Sind the common measure is the *toyo* with a capacity which may range from 4 to 5 seers according to the prevailing custom. The rule in Sind is for the measure to be heaped and not struck.

(3) VERIFICATION OF WEIGHTS AND MEASURES.

Model bye-laws prescribing the use of standard weights and measures have been framed by most of the local Governments and have been adopted by municipal authorities and district boards in many parts of India, but enquiries have shown that they are, more often than not, quite ineffective in practice. No regular system of inspection appears to function anywhere outside the Bombay Presidency, although isolated attempts to check and adjust weights were observed at one or two markets in the Punjab, e.g., Fazilka and Malaut. At the former the municipal committee has contracted with a local blacksmith for checking the weights of shopkeepers against standards obtained from the Calcutta mint. At Malaut a purely private agency undertakes this work twice yearly while at Abohar the municipal committee is contemplating similar measures to those taken at Fazilka. The situation in Delhi is perhaps typical of conditions elsewhere. The Punjab Municipal Act, 1911, provides for the checking of weights and measures by standard weights to be kept by municipalities. During this survey it was found that at Delhi, where this Act applies, the bazaar weights are never checked, nor apparently has this ever been done. The standard weights supposed to have been originally provided for the purpose could not even be traced in the office of the Delhi Municipality.

Having regard to the absence of regular checks and to the prevalence of so many kinds of weights and measures it is not surprising that a large number are faulty. An investigation recently completed under the auspices of the Board of Economic Inquiry, Punjab, covered 13 areas comprising about 19 towns, 12 *mandis*, 50 factories and 180 villages. Over 13,500 weights of all kinds were checked, 3,500 scales tested and 500 dry and liquid measures verified. Further some 1,350 cases of weighing were under observation. Only 51 per cent of the weights checked were found to be correct and of the incorrect, 41 per cent were underweight and 8 per cent over weight. Two-out of every three scales were defective. As regards measures, conditions were reported as "chaotic". This merely confirms the results of an earlier enquiry in the same province and reflects the utter confusion which exists not only in the Punjab but almost everywhere in India.

Note on the Bombay Weights and Measures Act, 1932.

The administration of the Bombay Weights and Measures Act, 1932, was entrusted to the Director of Industries and the Act was enforced in half the presidency from 1st August 1935 and in the remainder from March 1936.

Staff.—The Warden of Weights and Measures in the Department of Industries prior to taking up his duties was trained in His Majesty's Mint, Bombay. He has two Assistant Wardens, who, besides working in headquarters, tour in the districts and supervise the work of the inspectors of weights and measures.

In each district two Government Inspectors are appointed—one for the headquarters town and the other for the rest of the district. These officers were trained in the nature of their work under actual working conditions in the Weights and Measures Laboratory of the Department of Industries. There are at present 43 Government Inspectors of Weights and Measures and 23 Inspectors of Weights and Measures appointed by the different local bodies scattered all over the presidency. Each inspector is assisted by a manual assistant.

Equipment and Laboratories in the districts.—(a) *Government.*—In each district Government Inspectors are in charge of working standard weights and measures and weighing instruments and there are well built laboratories to house the standards and accurate weighing instruments in each district. The inspectors use this equipment to verify and stamp the wholesale and retail traders' weights and measures once in two years. The weights and measures kept in industrial establishments coming under the Indian Factories Act, are verified and stamped once every year. In each district, a set of secondary standards is also maintained. The inspectors use these to verify the working standards in their possession once every six months.

(b) *Local Bodies.*—The Government of Bombay have enforced the Act in the various districts with the co-operation of municipalities and district local boards. In most districts the headquarter municipality has appointed one inspector and the District Local Board has appointed another. A part of the headquarters municipal area is allotted to the Municipal Inspector and a part is allotted to the Government Inspector. Similarly, the area under the District Local Board is divided between the District Local Board Inspector and the Government Inspector for the district. Where the local body concerned has not appointed any inspection staff, the local Government has decided to enforce the Act entirely through the agency of its own inspectors and the entire work in such areas is done by Government Inspectors.

The local bodies' Inspectors have received a training similar to that of the Government Inspectors prior to taking up charge of their duties in their districts and they are provided with the same type of equipment as the latter. The stamping of the weights, etc., verified by the local body Inspectors is, however, done by the Government Inspectors in order to maintain a uniform standard. In Bombay city, the Municipality has four inspecting units and

laboratories located in different parts of the city. These inspectors attend to the verification as well as the stamping of weights and measures used by the trading establishments of the city. The inspection of industrial establishments under the Factories Act, Railways, Port Trust and other Government establishments, and manufacturers of, and dealers in, weights, measures, etc., in the city as elsewhere is, however, done exclusively by Government Inspectors.

Government Laboratories in Bombay City.—(i) A laboratory for trader's weights and measures has been set up by Government in the city of Bombay for the verification of weights, measures, etc., of the manufacturers of, and dealers in, weights and measures.

(ii) For the work of periodical verification of the secondary standards kept in the districts, a standards laboratory has also been set up by Government in the city of Bombay. This laboratory is equipped with weighing and measuring instruments, primary and secondary standards. The weighing instruments are highly sensitive and were specially designed and manufactured in the United Kingdom for local conditions.

Administration.—No special difficulty in the administration of the Act has so far been experienced by the Director of Industries. Standard weights and measures and balances have been introduced into all the large towns of the presidency and the remaining areas mostly upcountry are expected to be covered within the next six months by which time standard weights and measures will have been introduced throughout the presidency.

In its early days a number of representations were received from the public in regard to certain aspects of the Rules and the Act. As a result of these representations, Government took steps suitably to amend certain sections. The Bombay Weights and Measures Rules have also been suitably modified and the new Rules appear to meet the requirements of all sections of the trade.

The charges levied for verifying and stamping weights and measures of the public are a minimum of 3 annas for each weight between 1½ tola to ½ seer and 9 annas for any denomination between 1 seer and 1 maund. The former charge is also made for checking ½ oz. to 1 lb. weights and the latter for any weight above 1 lb. to 56 lb. Experience has shown that the administration of the Act is entirely self-supporting.

(4) SUMMARY.

The capacities of the main units of measures in the five most important wheat producing areas may be summed up as follows :—

Province.	Name of measure.	Capacity in tolas.
Punjab	Topa	130—400
U. P. (Basti)	Sai	90—120
Bihar and Orissa	Pailas	80
Central Provinces	Paili	80—320
Sind	Toyo	320—400

Measures are generally made of wood, iron, tin or copper. In certain rural areas baskets made of plaited straw, bamboo strips or any other similar kind of material are used for the purpose. Very occasionally earthen measures may be used. Dry measures are sometimes cylindrical but in the south of India the measures used for putting produce into bags are narrower in the middle than at the ends in order to afford a better grip.

B.—Scales Employed.

Throughout the country hand scales are used for weighing quantities up to 5 seers (10 lb.) and large beam scales* for weighing larger quantities, e.g., in bags. The pans of the typical hand scale

*The term "beam scale" means any equal armed weighing instrument the pans of which are below the beam.—Bombay Weights and Measures Rules. 1934.

are made either of leather or iron, while the beam scale has platforms of wood which are hung to the ends of the beam by stout iron chains. Platform scales or weighing machines of European or American pattern are almost exclusively used by the large flour mills, by exporters and by the more important transport agencies such as railways and steamship companies. Steel yards are very occasionally used for checking purposes at the ports.

C.—Units of Sale.

(1) FOR PRICE QUOTATIONS.

Under the existing conditions in which widely differing weights and measures are used by different markets, no uniformity can possibly be expected in the system of price quotations. This has already been touched on in Chapter III. Sometimes even in the same market, *e.g.*, Bombay, and for the same commodity, it is found that the methods of quoting prices are based on different units of weight. For “futures” transactions quotations for wheat are based on the hundred-weight (112 lb.) while for “spot” or “ready” sales the unit of quotation is per candy of $6\frac{1}{2}$ hundred-weights. In the retail market at Bombay prices were formerly quoted in annas per *paili* of four local seers, but this has now been standardised since the enforcement of the Bombay Act. In Karachi, the basis for quotations is the candy of 656 lb., while at Calcutta the maund of $82\frac{2}{7}$ lb. is the normal unit, although the bazaar maund of $82\frac{2}{15}$ lb. is in regular use. As a general rule wholesale rates are quoted in terms of price per unit of weight while in the retail trade it is more often than not customary to quote a weight per unit of value, *e.g.*, seers per rupee.

(2) FOR TRANSACTING DELIVERY.

The unit of delivery for the internal trade, in most of the wholesale markets, is a bag of $2\frac{1}{2}$ standard maunds. Orders to buy or sell “actuals” are usually given in bags of this unit. It should be noted, however, that this rarely coincides with the unit for price quotations. For example, at Hapur in the United Provinces prices are quoted in rupees per maund, while the units of delivery against “futures” contracts and “ready” or “actuals” are 25 tons and one bag respectively. When wheat is sold by the *khatti* (or pit) the unit may vary from 225 maunds to about 900 maunds. Each market in the western districts of the United Provinces where *khatti* storage underground is largely practised has pits of varying dimensions and capacity.

The units of delivery against “futures” contracts vary from place to place, but the most common is 100 bags equal to 250 maunds net. Notable exceptions are at Lyallpur, where the unit is the same number of bags with a different weight, *viz.*, 270 maunds, and Amritsar where the unit is 500 maunds. A 10 ton unit prevails at Calcutta and a 5 ton contract at one association in Bombay. At a recent informal conference in Delhi between representatives of a number of grain trade associations and the Central Marketing Staff it was decided that the standard weight for quoting prices should be the maund of $82\frac{2}{7}$ lb., and 500 maunds the minimum unit for delivery under “futures” contracts.

INTER-CHAPTER TWELVE.

No honest man could see any advantage in the present chaotic state of weights and measures throughout India. Weights made of sticks, stones, bricks and bits of old iron are a common feature in the markets and villages. A seer may range from 31 tolas to 102 tolas as in the Punjab, a *paseri* which is five seers, may range from 5 to 9 seers and the maund may go upto 64 seers as in parts of Bihar and Orissa. Even the tola—normally the weight of one rupee—is not always the same. Weights vary enormously from district to district and sometimes within the district itself. These differences become more baffling when they are of small dimensions. For example, in Calcutta, where the normal unit of sale is the standard maund of 82-2|7 lb., the bazaar maund of 82-2|15 lb., is in regular use.

Many municipalities and local authorities have bye-laws prescribing the use of standard weights and measures. The Punjab Municipal Act, 1911, for example, provided for the checking of weights and measures by standards to be kept by municipalities. A recent survey in the Punjab, however, showed that only about half the weights in use are correct and that 2 out of every 3 scales used for weighing are defective. This seems to indicate quite clearly that the control by local authorities is at present quite ineffective, and that no adequate steps are taken even where bye-laws do exist, to ensure that the weights in use are properly checked from time to time. In Delhi, for example, it was found that although the bye-laws provided for the checking of weights by means of standard weights to be kept at the office of the municipality no trace could be found of the latter after a prolonged search.

The Bombay Government are to be congratulated on having taken thorough and energetic steps to put in

force standard weights and measures throughout the presidency and Sind. The Bombay Weights and Measures Act was passed in 1932 and was made applicable to the whole presidency in March 1936 and the old bazaar and village weights will soon be a thing of the past in every district.

Far from being a source of expense to the local Government, the Act has in fact been self-supporting and yielded a substantial surplus. The Bombay Act with its accompanying rules and the system of administration seem therefore worthy of study by all Provincial Governments and State Durbars with a view to taking similar steps.

So long as there is a series of standard weights it seems a matter of no very great practical importance as to what the standards should be and in so far as the Bombay Government has given a lead and the units adopted are in accordance with the standard weights in use on the railways throughout India and on the lines recommended by earlier committees of enquiry it would seem desirable that other governments should follow suit and retain the same units with, if necessary, appropriate local vernacular names.

It seems impossible to over-emphasise the desirability, in fact the urgent necessity, for the standardisation of weights and measures as one of the first steps to be taken for the improvement of agricultural marketing.

Note on Governmental measures in other countries relating to wheat.

The position in the main exporting countries may be briefly described as follows :—

Canada.—As a result of semi-Governmental measures for stabilisation and by attempting to maintain the price level of Canadian wheat above the price of competing wheats on the world's markets, Canada found herself with stocks of about 300 million bushels or nearly 8 million tons as compared with one-fourth of that quantity which had been taken over from the Wheat Pools by the Central Selling Agency in 1930. This surplus, which was greater than the annual production of recent years, coupled with Canada's reduced sales abroad, caused an official enquiry to be held which resulted in Parliament setting up a Wheat Board to take over the holdings of wheat from the Canadian Co-operative Wheat Producers, Ltd., and from the Stabilisation Agency, with the object of furthering the sales of Canadian wheat. A change of government soon afterwards caused a complete re-shuffling of the members of the Board and has resulted in a more vigorous selling policy. After the peak of Australian shipments was passed in March 1936, the international wheat trade was dominated by Canada. Estimated end-of-season stocks in Canada were slightly more than 100 million bushels as compared with 203 million bushels at the same period in 1935.

The Canada Grain Act, 1930, provides for official standard grades and governs the system of inspection and all matters, *e.g.*, elevator charges connected with the marketing of wheat.

Australia.—The depression which overtook the world wheat market in 1929 threatened the Commonwealth's economic structure. As a temporary expedient the Government first assisted growers with a bounty on a production and acreage basis. It was decided, however, to afford a long term policy of assistance to the wheat industry as wheat growing had become unprofitable at the prices ruling since 1930, and the Royal Commission appointed in 1934 to enquire into the wheat flour and bread industries decided to recommend the principle of a "home consumption price for such part of the product as is consumed within the Commonwealth" through an excise on flour varying in accordance with wheat prices. An Act was passed in 1935 to give effect to the Commission's recommendations and prohibited inter-state trade except under licence. A recent judgment, however, against the Commonwealth in favour of a South Australian grower and processor of dried fruits releasing the latter from an order of the Australian High Court respecting certain consignments under the Dried Fruits Act, 1928-35, on the lines of which portions of the Wheat Act were framed, is likely to invalidate the system of controlled marketing affecting wheat and other primary products. The prohibition of trade between one State and another has, by this judgment, been declared unconstitutional, the constitution providing that commerce and intercourse among the various States of the Commonwealth shall be "absolutely free". In the meantime prices have generally improved and the geographical distribution of Australia's exports which was an unusual feature of 1934-35, when exports to the United Kingdom were only about one-third of the heavy exports to Japan and the Far East, has returned to the normal.

Argentina.—The disastrous fall in the price of agricultural produce between 1929 and 1932 coinciding with a succession of large harvests gravely affected the Argentine, and brought into being a system of exchange control and the fixation of minimum grain prices at calculated cost levels. The profits accruing to the Government from this exchange

control were utilised to offset losses incurred in the acquisition and subsequent sale by the government of the various commodities exported. The operations of the Grain Regulating Board at minimum prices in 1933 were responsible for the accumulation of large stocks in 1934 which however sold readily in consuming countries during 1934 and 1935 at prices above the minimum rates fixed, owing to short offerings of other export wheats. For the first time on record Argentina headed the list of exporting countries. In 1935 the Grain Act of the Argentine Republic provided for the creation of the National Grain and Elevator Board to function as an autonomous entity. The objects of the Board are to control all institutions or bodies which intervene directly or indirectly in the domestic or export grain business and to establish fixed types of wheat which correspond to the production in the various zones of the Republic and to determine the limits of the zones. Other functions of the Board are to control, on the advice of the National Office of Weights and Measures of the Ministry of Agriculture, the operation of all apparatus for ascertaining specific weights, grades, analysis of foreign matter, scales, etc., which are used in grain production or the grain trade. During 1936 a Commission was busily engaged in examining and classifying samples of the several varieties of wheat grown in the Argentine in order to establish standards for the official grades as contemplated by the Grain Act. The National Grain and Elevator Board was constituted in August 1936 and one of its first acts was to approve the official standards for wheat, oats, barley, rye and linseed crops of the season 1935-36. These standards not only specify the commercial quality but also the milling and baking qualities. Regulations for the control of exports of grain were recently announced to come into effect on December 1st, subsequent to which date every exporter of grain will be required to advise the Board of the time of loading, so that these operations may be duly inspected and the grain sampled officially. Provision is also made for the shipment of grain of a quality inferior to those recognised by the responsible trade committees or with an impurity content greater than the standard. In such cases inspectors are required to take proper precautions to prevent the mixing of such grain with other grain. Another regulation provides for the establishment of a register of stocks of grain and requires every grain merchant to report each month the quantity of grain of which he is the owner, specifying its characteristics and where it is to be found, etc. The object of the register is to enable the Board to watch the movement of the crops and be in possession of exact information as to stocks, etc., at all times of the year. These regulations come into effect on January 1st 1937. An office of the Board is being established in London for the purpose of keeping the Board advised in regard to conditions in European consuming markets.

United States.—The accumulation of world stocks from 1928 onwards, resulting from large acreage increases and bumper harvests, also forced the United States to adopt farm relief measures. These originally took the form of co-operative pooling by producers. In 1929, however, the government established the Federal Farm Board "operating upon the theory that by purchase and control of accumulated surplus, price domination through creation of artificial scarcity could be achieved". This having failed, governmental efforts to control production were directed to a new channel namely to induce producers voluntarily to curtail acreage for a consideration in the shape of benefit payments in proportion to the acreage reduced. After some two years' trial this too proved to be unworkable as the acreage reductions made by those willing to accept the government's terms were offset by increases on the part of farmers

who remained outside the scheme. Moreover the power of the government to control agricultural production was held by the Supreme Court to be void and the Agricultural Adjustment Act was declared to be "a statutory plan to regulate and control agricultural production, a matter beyond the powers delegated to the federal government".

Shortly after the Supreme Court's decision the Soil Erosion Bill was introduced to replace the Agricultural Adjustment Act, in part, the intention being to induce farmers to withdraw from cultivation land normally devoted to growing surplus agricultural produce either by compensation or by outright purchase. In August 1936 the Resettlement Administration decided to purchase about 5 million acres in the region of the Great Plains to be converted into grazing land. The Government has also approved the purchase of 2.5 million bushels of wheat grown in the States of Washington, Oregon and Idaho to be converted into flour for relief purposes in certain other states which the maladjustment of supplies caused by the droughts of 1934-35 has left short of milling wheat.

The regulation of commodity exchanges has been the subject of legislation and the Commodity Exchange Act came into effect early in September 1936. The object of this law, to which reference has already been made in Chapter IX, is to diminish or eliminate the burden of excessive speculation by the fixing of trading regulations governing the volume of speculative trading in "futures" in any commodity covered by the Act. "Bucket Shops" are outlawed and all fictitious practices are prohibited in connection with the sale of any commodity in inter-state commerce. The Commission created by the Act for the purpose of administering it has the power of closing any exchange which violates the rules of the Act. A system of official grain standards is in force throughout the United States.

South Africa.—Another attempt at controlled marketing is seen in the Wheat Industry Control Act, 1935. The Act provides for Board of eight members having power (a) wholly or partially to compensate wheat producers or co-operative organisations for any losses sustained in consequence of the storage of wheat and (b) to advise the Minister in regard to the control and regulation of imports and exports, fixation of grades and all other matters relating to production and marketing. A number of changes have been made in the original measure and the Agricultural Marketing Bill, 1936 has been re-introduced into Parliament after consideration by a Select Committee. The Bill provides "for the regulation of the production and sale of agricultural products" through the establishment of marketing boards, and closely resembles agricultural marketing legislation in the United Kingdom.

The position in main consuming countries, in Europe, reflects the prevailing tendencies of recent years to impose quotas and other restrictions on the importation of wheat and many agricultural commodities with the object of encouraging domestic production and attaining national self-sufficiency, particularly in respect of food stuffs.

United Kingdom.—In the United Kingdom the Wheat Act passed in 1932 was framed to protect domestic producers. From 1st March flour from non-Empire sources was also made subject to a duty of 10 per cent *ad valorem* and in November 1932 a duty of 2 shillings per quarter (480 lb.) was imposed on wheat of non-Empire origin. In June, the price-supplementing system of "deficiency payments" to be made to wheat growers was introduced, and to provide funds for the purpose "quota payments" were levied on all flour manufactured in the United Kingdom or imported. The Act specified a "standard price" of 10 shillings per cwt. If

registered growers failed to realise this price from the sales of wheat they should receive a deficiency payment equal to the difference. The method of arriving at the deficiency payment is the difference between the "ascertained average price" and the "standard price" subject to two deductions, namely, one to defray the cost of administration and secondly a proportionate reduction in the deficiency payment should the quantity of domestic wheat sold by registered growers in the cereal year exceed the anticipated supply of the year which is limited, by the act, to 27,000,000 cwt. One of the immediate effects of the subsidy was an increase in domestic acreage from 1.34 to 1.74 million in 1933. The import duty on wheat which came into force later in the year did not have much effect on shipments to the United Kingdom owing to the large crop in the Argentine and the greater disposition of sellers in that country to meet the demand at low prices. The Wheat Act is perhaps an outstanding example of legislation of this type and its success is due to the fact that wheat is not only bought and sold on a free market but the channels of disappearance have not been interfered with. In August 1936 the "quota payment" in respect of deliveries of flour has been reduced to 9.6d. per cwt., as compared with 1 shilling since the end of February. This is due to the recent rise in the values both of wheat and flour.

France.—High import duties and prohibitive milling quotas have been in force for some years. The heavy crop of 1932 coinciding with fall in prices resulted in further governmental measures, and early in 1933 provision was made for the acquisition by Government of home-grown wheat to the value of three hundred million francs. Later in 1933, when it was obvious that another large crop was in view, a minimum price to farmers was fixed by law for a period from 15th July 1933 to 15th July 1934. The immediate result was a sharp rise in prices in July 1933. These controls were continued with additional measures in the shape of a bounty on exports, for a brief period only, prohibition of planting wheat on land used for this crop in 1933 and enlargement of financial facilities for storage by Government. In spite of high prices, consumption seems to have been stimulated but not to such an extent as to relieve the pressure of stocks which swelled to record dimensions by the end of the crop year. In 1934-35 France, hitherto a net importer, became the largest European exporter ranking fourth among the exporting countries, a situation resulting as much from three successively large harvests as from government measures restricting imports, regulating milling and reducing the quality of flour. The export bounty was increased during 1934-35 and imports from French colonies except those of *durum* wheats, were severely restricted. In August 1936 a law for the establishment of a National Wheat Board was promulgated. This Board is a public body with legal status and financial autonomy and operates under the Ministry of Finance as regards the financial operations and under the Ministry of Agriculture in regard to technical matters and administration. The principal object in the setting up of the Board is the fixing of a legal wheat price and the maintenance of this price by interposing the Co-operative between the farmer and the miller, the latter being supplied directly by the Co-operative. The Board has also a monopoly over imports and exports. Approved co-operative societies will be permitted to purchase wheat from the producers and it is possible that many new societies will have to be established for the purpose. Aided by the Agricultural Credit Fund with the backing of the Bank of France these societies will be empowered to grant credit facilities to farmers and the costs will be met from the fund contributed by farmers, except those with the smallest holdings, in the form of a levy on all wheat sold by them. Under the new law the functions

of grain dealers are not substituted by the Co-operatives. The difference between the former and the latter is that the Co-operatives must purchase all wheat offered to them by their members and participating non-members, while the dealers are not under a similar obligation. When dealers have concluded transactions, regulations governing co-operatives are equally applicable to them. The new system exceeds all previous efforts to control marketing by the State in France. Individual traders will no longer be in direct contact with growers. The quotations of produce exchanges of wheat prices are now forbidden and the Wheat Exchanges have literally ceased to exist.

Other Countries.—In Italy since 1925 an attempt has been made to attain self-sufficiency in respect of wheat. In 1936 the re-organisation of the wheat market was completely effected and all the wheat produced in Italy or imported must now be consigned to collective depots for collective sale under a Central Bureau which also controls the storage. The price of wheat is fixed each year by the Ministry of Agriculture.

In Germany along with high tariffs a quota system is applied to the mills. In Sweden, Norway, the Netherlands and most of the other countries of Europe a system of control by State monopolies reinforced in some cases by milling quotas, high tariffs and the prohibition or licencing of private import trade is the common practice.

FINAL INTER-CHAPTER.

GENERAL CONCLUSIONS AND RECOMMENDATIONS.

This report aims at getting better returns for Indian wheat cultivators and indicates how this can be achieved at no distant date. The gains to which the report draws attention are, however, not to be had for the asking but involve increased effort and efficiency on the part of all concerned. Certain recommendations on points of details are to be found at their appropriate place in the body of the report and are better read in their context. Only the more general conclusions and recommendations are summarised here.

The uninitiated always think that the marketing of wheat is one of the easiest problems to tackle. This is probably because wheat being one of the world's staple foods has been the subject of more study—outside India—than any other commodity. The welfare of the inhabitants of some countries depends on maintaining a large export trade in wheat. In others, whereas wheat imports are essential to the population as a whole, their control is of vital importance to local producers. Governments in exporting and importing countries for years, therefore, have been trying and are still trying by one device or another to improve the conditions of their cultivators with varying degrees of success. In India there is perhaps a tendency to rely overmuch on Government beneficence. The fact that there is State regulation of the wheat trade in many other countries encourages this attitude here, but it is not possible to apply to Indian conditions the forms of Government action taken in countries with a regular export or import trade. Here the problem is entirely different.

Exports of wheat from India are spasmodic and depend not only on the world price of wheat but also on the relative price of barley, gram, rice, maize and other

competing food stuffs. If in the internal market these are cheap as compared with wheat more wheat will be available for export, and not otherwise. The large firms customarily engaged in the export trade are sufficiently well organised to deal with this trade as opportunity offers. The railways also have co-operated by reducing freights on wheat destined for export. There is apparently not much more that can be done to encourage exports of wheat without injuring the interests of the cultivator.

If people in India prefer to consume the wheat rather than part with it at the price offering on the world markets that is their affair. Exporters quite naturally wish to do as much trade as possible and to buy as cheaply as they can ; but if, in order that they might attain their objective, it becomes necessary to impart a greater degree of instability to Indian wheat prices and to accentuate the marked seasonal depression which faces cultivators at every harvest, an increased export trade might do more harm than good. The strong and prolonged bearish tendency of the July "future" at Karachi cannot be ignored since it is probably characteristic of the factors which are at work in the export trade.

In regard to imports the Government of India imposed a duty on wheat and wheat flour which by preserving the internal market for Indian produce had some stabilising effect on prices and on the channels of distribution in the internal trade. Although only partially effective in regard to price any attempt to make it more effective by raising the duty would probably have failed because of the internal competition between wheat and other substitute food stuffs. Stability is probably in the long run more important to both producers and consumers than either the raising or lowering of prices.

Apart from the external trade in imports and exports of wheat the *Government of India* should not be

called upon to function except through the Central Marketing Staff acting as a co-ordinating agency between local Governments and trade interests throughout the country and initiating where possible practical improvements of an experimental character, *e.g.*, in regard to grading and standardisation. The main problems of wheat marketing are connected with the internal trade, and where Government action is called for in the interest of producers this could apparently best be done by the local Governments and State Durbars concerned. The following are some of the main points which might commend themselves to the interest of local Governments.

The standardisation of weights and measures as administered by municipalities and other local bodies on the basis of existing legislation has proved quite ineffective. The existence of countless inaccurate weights and measures—many deliberately false—and the absence of uniformity in different parts of the country are a serious obstacle to trade. The Bombay Government, with profit to the local exchequer and to the advantage of producers and traders, has enforced an Act to standardise weights and measures throughout the Presidency. This example might well be studied and followed even to the extent of adopting the same standard weights—with appropriate local names if necessary.

The number of trade associations dealing in "futures" in certain provinces is excessive. It is essential that such bodies should be fully representative, financially sound and capable of ensuring strict compliance with contracts made on the basis of standard quality and other terms. Local Governments might therefore consider the possibility of giving statutory recognition to one or at most two associations in the province or State in the same way as the Bombay Government recognises the rules, regulations and bye-laws of the East India Cotton Association. Though the legislative action may be provincial there is great need for

uniformity in certain essential matters, especially in the terms of "futures" contracts. In matters such as these the Government concerned will doubtless seek the advice not only of their local Marketing Staff but also of the Central Marketing Staff and any all-India federation of grain trade associations which may exist.

Reduction and regulation of market charges is a matter for urgent attention on the part of local Governments if the growers are to receive better returns. This may be tackled in various ways according to local conditions. Existing Markets Acts in Bombay, Central Provinces, Madras and Hyderabad for example, might be further extended to grain markets and other Governments might be expected to study and adopt corresponding legislation and regulations. These Acts provide for statutory recognition being given to a scale of charges drawn up by the proper authority in each regulated market.

It is possible, however, that some Governments may prefer to advance on a wider front and declare certain customary charges, *e.g.*, *karda*, *bardana*, etc., to be not enforceable by law except with the prior consent of the seller in writing. Whatever the method of approach the fullest possible use should be made of the local Marketing Staffs which should be extended as required so as to be able to undertake the additional duties involved.

The dissemination of market news to cultivators needs to be done locally. Information regarding stocks and prices could be collected from the more important markets and disseminated daily to the smaller primary markets if the necessary funds and staff were made available to the local Marketing Officer. Full use could also be made of the radio and the press in order to put sellers on more even terms with buyers.

Other general matters but none the less vital requiring the attention of local Governments are the incidence of municipal octroi duties, terminal taxes and tolls which appear to bear very heavily on the producers and also the consideration of such measures as would lead to the cessation of payments in kind on account of harvest wages, etc., and lead to the abandonment of a barter for a money economy in the villages.

The foregoing points relating to action by local Governments have been placed first but probably more can be done by traders themselves—and that more quickly—so as to make the system of distribution more efficient and less costly with advantage to all concerned.

In some markets local trade associations have been effective in standardising and reducing market charges. They have also, *e.g.*, at Muzaffarnagar, introduced an improved system of ferro-concrete storage, not only with profit to the association but also with advantage as regards the quality and price of wheat stored there. Wastage has been reduced to a minimum. Incidentally if a similar system be universally applied to all grains the constant recurrence of serious outbreaks of plague might be largely prevented.

Standards of quality and of contract terms for buying and selling, particularly on the “futures” markets, are primarily a matter for the trade. They have already shown their willingness and readiness to take steps about this. A closer affiliation of the larger grain exchanges throughout the country into a representative all-India body would speed up action on those lines and promote a greater degree of inter-trading than exists at present. An organisation of this kind could quickly reduce to some semblance of order the present multiplicity of trade descriptions and bases of price quotations. The question of instituting a suitable standard contract for *durum* wheat seems a matter

which could easily and readily be done by agreement between the leading grain trade associations. The provision of better market information regarding wheat stocks, movements and prices concerns the trade. In this direction also they have shown their readiness to assist, in providing a basis for a weekly broadcast by the Central Marketing Staff.

Organised trade associations might also put their house in order. Hitherto the conditions of trading in some of the important grain exchanges have been primitive in the extreme. Recently Karachi and Bombay have given a lead in erecting business premises comparable with the dignity and status of their respective associations and where business can be done in decency and comfort at all seasons. Other associations will presumably follow suit and the example, it is hoped, will percolate down to the smaller markets where the layout, cleanliness and sanitary conditions generally leave much to be desired. It is to be hoped that the influence of a well organised body of grain traders may be effective in instigating municipal authorities into taking action for providing proper services and exercising adequate control over their local market places.

Among transport agencies country boats, camels, donkeys and other pack animals go their own way and no one complains much about river and coastal freight. The fact that recent developments in Sind have brought the surplus wheat producing area nearer the coast is a matter for congratulation by all traders at the ports from Karachi to Calcutta. The motor lorry has become in some districts a serious competition of the railways. Even in some cases where the freight is more senders prefer to employ the motor lorry as it provides a quicker and more efficient service and eliminates the palaver at stations which is apparently generally accepted as inevitable. It is doubtful, however, whether motor transport rates are always economic.

Agricultural Departments have been doing good work in producing and propagating improved varieties of common white wheats (*T. vulgare*) suitable for making *chapatis* and fermented bread. Something more might perhaps be done on the same lines for *durum* wheats having regard to their special suitability for macaroni, etc. Indian wheat cultivators have shown that they are by no means conservative in adopting new varieties but they have their idiosyncracies and it would seem desirable that Agricultural Departments should follow up the seed distribution of new types to ensure that the seed as issued is actually sown. The enthusiasm of plant breeders for creating new crosses and types can be appreciated but as well as having regard to consumers requirements the departments should consider the needs of the trade for obtaining unmixed types in different districts. Common wheats (*T. vulgare*) should not therefore be propagated in typical *durum* districts without good reasons.

There remains the question of what the wheat producers should do for themselves. There is, of course, the co-operative movement but producers' co-operative trading societies in this country have not passed the elementary stage. Those that exist function only as *kachcha arhatiyas* and sell their wheat locally in their own markets. It is claimed that by doing so they have kept down the local market charges and to this extent they perform a useful function. They have, however, no facilities for selling in distant markets and there are few urban consumers' co-operative societies with which they might usefully be linked up. The main object of the local co-operative departments therefore should be to provide some such distributive machinery either by employing existing firms as agents or by establishing some other suitable agency for the purpose. The possibility of establishing closer relations between the financially sound producers' and consumers' societies

might, however, be considered especially where the co-operative banks concerned can guarantee the respective accounts and are equipped to clear the railway receipts quickly.

This report in some parts seems almost to ignore the interests of the wheat grower and to point to opportunities for enterprising youth to establish themselves in business as merchants or as owners and operators of stone mills (*chakkis*) or in organising baking or the production and distribution of cereal products such as *sewayan* (vermicelli), macaroni, *suji* (semolina) and the like. An influx of educated youth into these spheres should do much to improve the whole machinery of distribution. The cultivator at present gets about three fifths of the consumer's rupee and his best chance of obtaining a higher return seems to lie in increasing the efficiency and reducing the cost of distribution generally. It is hoped that this report shows how this might be done.

The Central Marketing Staff have already done something towards improving conditions. The main terms of a standard contract for white wheat have been agreed on with the trade and several local associations have made alterations in their existing contracts so as to bring them into conformity with the proposed all-India standard. This question is being further pursued.

Arrangements were also made to collect the information necessary to provide a weekly broadcast giving the stocks, movements and prices of wheat—both 'ready' and 'futures'—at the main port and up-country markets. This service commenced operating at the beginning of November 1936 and is being extended.

As a small contribution towards eliminating the large amount of dressing and redressing of wheat done by retail purchasers an experiment has been initiated for selling *ata* prepared from cleaned, washed and conditioned wheat of different grades. Small sealed and branded bags of 10 seers have been used for the *ata* so that consumers can with certainty obtain a clean and good article of pure and reliable quality.

These trial steps have shown that there is a surprising amount of mutual interest and goodwill among the better class of cultivators, merchants and manufacturers in India who are apparently prepared to sink old superstitions, to deal openly and fairly and march together along the road of progress. There are, at least, good grounds for optimism.

APPENDICES.

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APPENDIX I.
Production of wheat in the main producing areas.
 (Million tons.)

Years.	British India.					Indian States.					Grand Total India.			
	Total British Provinces.	Punjab.	United Provinces.	Central Provinces.	Bombay.	Sind.	Others.	Total Indian States.	Central India States.	Gwalior.		Hyderabad.	Punjab States.	Others.
1925-26 ..	7.1	2.9	2.3	.9	.2	.1	.7	1.7	.39	.34	.07	.45	.45	8.8
1926-27 ..	7.4	2.9	2.5	.8	.2	.1	.9	1.7	.36	.28	.06	.48	.52	9.1
1927-28 ..	6.3	2.3	2.4	.6	.3	.1	.6	1.6	.28	.16	.08	.42	.70	7.9
1928-29 ..	7.3	3.1	2.5	.5	.3	.1	.8	1.4	.29	.19	.14	.35	.46	8.7
1929-30 ..	8.9	3.8	3.3	.6	.2	.2	.8	1.8	.27	.18	.11	.43	.84	10.7
1930-31 ..	7.6	3.1	2.7	.6	.3	.2	.7	1.9	.33	.27	.13	.44	.75	9.5
1931-32 ..	7.3	2.8	2.6	.7	.3	.1	.8	1.9	.34	.30	.16	.39	.74	9.2
1932-33 ..	7.6	2.8	2.7	.7	.3	.3	.8	2.0	.34	.32	.17	.44	.73	9.6
1933-34 ..	7.5	2.8	2.5	.7	.3	.4	.8	2.1	.41	.30	.15	.46	.78	9.6
1934-35 ..	7.7	3.0	2.5	.8	.3	.3	.8	2.2	.42	.39	.16	.46	.80	9.9
Average ..	7.5	2.9	2.6	.7	.3	.2	.8	1.8	.3	.3	.1	.4	.7	9.3

Source.—Estimates of Area and Yield of Principal Crops in India.

APPENDIX II.
Average under wheat in the main producing areas.
 (Million acres.)

Year.	British India.						Indian States.							
	Total British Provin-ces.	Punjab.	United Provin-ces.	Central Provin-ces.	Bombay.	Sind.	Others.	Total Indian States.	Central India States.	Gwalior.	Hyder-abad.	Punjab States.	Others.	Grand Total India.
1925-26	23.9	9.5	6.9	3.5	1.1	0.4	2.5	7.1	1.9	1.4	.8	1.2	1.8	31.0
1926-27	24.1	9.4	6.7	3.7	1.3	0.5	2.5	7.7	1.9	1.4	1.0	1.2	2.2	31.8
1927-28	24.5	9.0	7.5	3.7	1.5	0.4	2.4	8.2	2.0	1.5	1.1	1.3	2.3	32.7
1928-29	24.8	10.0	7.1	3.2	1.7	0.4	2.4	7.7	1.9	1.0	1.1	1.3	2.4	32.5
1929-30	24.6	10.0	7.2	3.0	2.0*	..	2.4	7.6	1.8	.9	1.0	1.4	2.5	32.2
1930-31	24.6	9.3	7.6	3.1	1.7	0.6	2.3	8.1	1.9	1.1	1.2	1.4	2.5	32.7
1931-32	25.1	9.1	7.7	3.5	1.8	0.5	2.5	9.2	2.2	1.5	1.4	1.3	2.8	34.3
1932-33	24.8	8.6	7.7	3.5	1.5	1.1	2.4	8.7	2.1	1.4	1.3	1.3	2.6	33.5
1933-34	27.3	9.8	7.7	3.4	1.8	1.4	3.2	9.3	2.1	1.5	1.2	1.5	3.0	36.6
1934-35	25.5	9.0	8.5	3.6	1.8	1.1	1.5	9.5	2.3	1.6	1.3	1.4	2.9	35.0
Average ..	24.9	9.4	7.5	3.4	1.6	.7	2.3	8.3	2.0	1.3	1.2	1.3	2.5	33.2

*Including Sind.

Source.—Estimates of Area and Yield of Principal Crops in India.

APPENDIX III.

Acreage under wheat (a) irrigated and (b) unirrigated in the main producing areas.

(Million acres.)

Year.	Punjab.				United Provinces.				Central Provinces.		Sind.		Bombay.		Bihar and Orissa.	
	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.
1925-26	5.1	4.4	3.5	3.4	..	3.5	..	3.5	..	3.5	..	3.5	..	3.5	..	3.5
1926-27	5.0	4.4	3.7	3.1	..	3.6	..	3.6	..	3.6	..	3.6	..	3.6	..	3.6
1927-28	5.1	3.9	1.8	5.7	..	3.7	..	3.7	..	3.7	..	3.7	..	3.7	..	3.7
1928-29	5.3	4.7	3.8	3.3	..	3.2	..	3.2	..	3.2	..	3.2	..	3.2	..	3.2
1929-30	5.6	4.4	3.8	3.4	..	3.0	..	3.0	..	3.0	..	3.0	..	3.0	..	3.0
1930-31	5.4	3.9	3.6	4.2	..	3.1	..	3.1	..	3.1	..	3.1	..	3.1	..	3.1
1931-32	4.9	4.2	3.8	4.1	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4
1932-33	5.0	3.6	3.7	4.1	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4
1933-34	5.0	4.8	3.9	4.7	..	3.3	..	3.3	..	3.3	..	3.3	..	3.3	..	3.3
1934-35*	5.2	3.8	4.0	3.7	..	3.2	..	3.2	..	3.2	..	3.2	..	3.2	..	3.2
Average	5.2	4.3	3.5	4.0	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4	..	3.4

* British India only (not included in the average).

Source.—Agricultural Statistics of India.

APPENDIX IV.
Approximate average monthly arrivals of wheat at certain important centres of production and consumption.
 (100 tons.)

Month.	Punjab. *	Delhi. *	United Pro- vinces.	Gwalior.	Sind.		Bombay city.		Calcutta.		Hydera- bad Dn. **	Madras. **	Cochin port.
	Average of 2 mar- kets. †		Average of 8 mar- kets. ‡		4 mar- kets. §	Karachi. *	By sea.	By rail. ||	By sea (from Karachi). ¶	By rail.	Hingoli- market.	Madras port.	
January	31.6	68.0	85.2	2.5	6.2	110.3	28.3	45.2	44.8	155.5	1.4	.7	1.4
February	30.1	55.5	88.2	2.5	.7	101.1	15.4	66.5	3.6	130.1	3.3	.3	1.8
March	43.0	42.2	78.3	1.4	.7	98.9	22.0	70.5	10.2	120.9	5.8	1.1	1.4
April	40.0	50.3	109.5	6.2	3.6	95.2	24.2	101.1	5.1	108.4	7.7	1.4	1.1
May ..	132.7	79.0	211.7	13.2	52.2	349.6	43.0	194.4	9.5	187.5	5.5	1.8	1.1
June ..	180.5	82.3	131.2	4.7	83.4	821.3	50.3	162.5	45.2	139.7	.7	1.1	1.4
July ..	178.6	69.8	94.8	.7	37.8	627.2	113.6	96.3	129.4	79.4	.3	.7	.7
August	83.0	47.7	67.2	.3	16.1	361.7	60.6	54.4	173.9	97.0	.3	.7	.7
September	61.7	56.2	64.3	.3	7.3	203.3	45.9	54.7	144.4	63.6	.7	.7	1.4
October	56.2	70.5	73.9	.3	7.3	57.7	41.5	141.9	132.7	68.3	.7	1.1	1.4
November	38.2	66.1	81.9	2.5	4.4	106.6	66.5	73.1	86.0	23.5	1.1	.3	.7
December	31.2	57.7	79.0	2.9	3.6	139.3	28.3	50.7	19.1	90.8	2.2	.7	1.8

* Average of 5 years' arrivals.

† Lyallpur and Gojra.

‡ Average of 3 seasons' arrivals at Meerut, Aligarh, Bareilly, Lucknow, Najibabad, Fyzabad, Benares and Jhansi

§ Average of 2 seasons' despatches by rail from Nawabshah, Dadu, Shahdadkot and Mirpurkhas.

|| Figures for 1935.

¶ Average of 4 years' ship-mats.

** Average of 2 years' arrivals.

APPENDIX V.
Production of wheat flour in India by certain large roller mills.
 (Tons.)

Month.	1932-33.	1933-34.	1934-35.	1935-36.	Average.	Percentage on the total.
April ..	49,336	36,959	40,647	39,257	41,549	8.2
May ..	46,932	49,634	39,839	39,929	44,089	8.6
June ..	47,617	41,034	38,227	38,636	41,379	8.1
July ..	43,756	40,089	40,776	43,832	42,113	8.2
August ..	49,314	41,448	43,348	40,459	45,142	8.9
September ..	50,279	44,770	43,359	48,226	46,659	9.2
October ..	44,671	45,809	50,525	42,708	45,928	9.0
November ..	47,138	36,595	45,250	39,204	42,047	8.2
December ..	45,037	39,732	45,038	39,279	42,272	8.3
January ..	45,122	44,064	40,839	41,845	42,967	8.4
February ..	40,539	38,536	33,422	33,691	36,547	7.2
March ..	38,235	40,535	40,041	36,620	38,998	7.7
Total	547,996	499,205	501,871	489,986	509,690	100.0

Source.—“Monthly Survey of Business Conditions in India”.

APPENDIX VI.

Classification of commercial types and descriptions in use in different districts.

Province or State.	Triticum vulgare.							Triticum durum.	
	White.		Red.		Mixture of white and red.			White or amber.	Red.
	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.	Mixture of hard and soft.		
<i>Punjab—</i>									
Canal Colonies	Sharbati ..	..	Lal Kanak ..	..	Dara ..	..	Dara ..	..	..
East and South East.	Do.	Pissia ..	Do.	..	Dara ..	..	Dara ..	..	..
North	Do.	..	Desi Kanak ..	..	Dara ..	..	..	Wadanak ..	..
West and South West.	Sharbati	..	Watni Kanak	..	Dara ..	..	..	..	..
<i>United Provinces—</i>									
West	Sharbati Chandausi, Farm Ka Gehun.	Safed Gehun or Davdi, Farm Ka Gehun.	Desi Lal	..	Dara or Gajjar.	Dara ..	Kathia	..	..
Central	Gangajali, Sharbati Farm Ka Gehun.	Desi or Safed Pissia.	Desi Lal	..	..	Dara ..	Dara ..	..	..
East.	Hansi Farm Ka Gehun	Hansi Pissia .. Pissia .. Farm Ka Gehun	Lalia Gehun	..	Dara ..	Dara ..	..	..	..
South Bundelkhand).	Farm ka Gehun	Safed Pissia ..	Pissia Lal	..	..	Dara ..	..	Safed Kathia ..	Lal Kathia.

APPENDIX VI—contd.
Classification of commercial types and descriptions in use in different districts.

Province or State.	Triticum vulgare.						Triticum durum.	
	White.		Red.		Mixture of white and red.		White or amber.	Red.
	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.		
<i>Bombay—contd.</i> Imported wheats	Sharbati ..	Pissi Delhi-Cawnpore.	..	..	Karachi† Bangla.	..	Khandwa *	..
<i>Bihar—</i>								
East ..	..	..	Jogra or Jogia (mixture of hard and soft).	..	..	..	..	..
Shahabad ..	Dandi ..	Dudhia ..	Lalka or Jamali ..	Lalka or Jamali.	..	..	..	..
<i>Bengal—</i>								
Rajshahi ..	}	Dudhia ..	..	Jamali ..	..	..	Gangejahi, Kheri.	..
Maldia ..		Cawnpore†	..	..	..	..	..	..
Imported wheats	Sharbati† Chandauri.†							
<i>Sind—</i>								
North ..	Sharbati Thoree. Sharbati ..	Popri Bojiri. Thodi or Safed Pissi.	..	..	..	..	Kony * (Kasmi).	..

APPENDIX VI—*contd.*
Classification of commercial types and descriptions in use in different districts.

Province or State.	Triticum vulgare.						Triticum durum.	
	White.		Red.		Mixture of white and red.		White or amber.	Red.
	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.	Hard or semi hard.	Soft.		
<i>Registars—contd.</i>								
Dholpur ..	..	..	..	Pisai ..	..	..	..	Katha.
Datia ..	..	Safed Pisai	..	Pisai Dharvan Pisai Fard.	..	..	..	Gehun or Kathia.
Kotah ..	..	Safed Pisai	..	Pisai Lal	..	Pisai Gajar.	Safed Katha ..	Khata Gajar.
Banswara ..	..	..	..	Bejia ..	..	..	Devat Kani ..	Kathia.
Parbhagarh ..	Pisai Cutia, Mudia..	..	..	..	..	Kabra (red and white pisai).	Devat Khani ..	Lal Gehun.
Odipur ..	Chandana ..	..	..	Lal Bejia	..	..	Pakvani ..	Lal Katha.

APPENDIX VII.
*Average monthly wholesale prices of Australian and La Plata wheats in the United Kingdom (C. I. F. Liverpool and/or London) * and Indian wheat at Karachi† (ex-store).*

	1920-21.			1921-22.			1922-23.			1923-24.			1924-25.		
	La Plata.		Karachi.	La Plata.		Karachi.	La Plata.		Karachi.	La Plata.		Karachi.	La Plata.		Karachi.
	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.
April	94 1	96 0	46 3 3	74 0	77 6	53 15 0	54 8	56 10	n. q.	47 11	52 7	42 15 0	43 7	46 2	36 5 0
May	94 0	96 0	45 3 0	74 11	75 9	57 5 4	54 6	57 6	53 10 0	48 5	51 3	40 14 10	43 7	47 5	37 14 0
June	94 0	96 0	44 4 8	80 2	77 5	57 0 0	51 3	53 1	51 0 10	45 7	49 5	39 1 0	45 1	48 5	38 9 0
July	94 0	96 0	n. q.	76 6	76 3	62 1 6	51 11	53 1	49 1 0	43 2	46 8	36 15 0	50 2	52 4	42 14 0
August	94 0	96 0	n. q.	76 6	71 3	69 11 0	48 3	52 0	47 8 5	40 10	44 2	34 1 7	53 6	55 6	46 6 0
September	94 0	96 0	n. q.	71 11	69 0	70 4 5	44 10	49 6	44 2 0	41 11	44 8	35 8 6	56 2	58 7	46 7 0
October	102 0	106 0	n. q.	55 10	56 4	73 3 6	49 5	51 0	44 3 0	42 7	45 2	34 12 0	63 10	63 4	48 4 0
November	114 0	121 0	n. q.	49 6	49 4	72 0 0	50 7	52 3	45 0 0	44 7	45 9	35 6 8	62 1	63 10	48 11 0
December	102 9	111 6	n. q.	50 6	50 0	n. q.	48 7	53 1	42 12 0	43 4	45 6	36 6 0	61 8	64 4	47 14 10
January	96 0	103 3	50 7 0	47 7	50 7	n. q.	47 2	51 10	42 12 0	44 11	46 1	36 5 7	68 1	67 9	51 10 0
February	73 9	87 6	50 3 0	56 2	55 1	n. q.	45 5	49 0	39 12 6	45 2	47 0	37 3 6	69 5	70 3	55 3 6
March	72 6	85 0	52 5 7	55 10	56 0	n. q.	45 3	49 2	39 13 7	43 11	47 4	37 5 6	64 0	65 1	58 4 6

* International Year Book of Agricultural Statistics, Rome.

† Chamber of Commerce, Karachi.

n. q. no quotation

NOTE.—Prices of Australian and La Plata wheat in the United Kingdom are in shillings per quarter of 480 lbs.

Prices of Indian wheat in Karachi are in rupees per candy of 656 lbs. (Basis 2% Barley, 1½% extraneous matter).

APPENDIX VII—*contd.*
Average monthly wholesale prices of Australian and La Plata wheats in the United Kingdom (C. I. F. Liverpool and/or London) and Indian wheat at Karachi† (ex-store).*

	1925-26.			1926-27.			1927-28.			1928-29.			1929-30.		
	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.
	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.
April	57 2	57 4	51 7 7	53 3	58 1	49 0 0	50 6	53 2	42 15 6	50 10	54 1	41 5 0	40 10	44 11	43 15 0
May	60 11	58 9	51 9 0	54 3	58 9	47 9 6	54 2	54 11	43 6 0	51 9	54 10	43 0 10	38 3	42 0	39 13 2
June	58 6	56 4	50 12 0	54 6	58 10	45 5 0	54 4	56 3	43 7 0	48 6	52 9	41 3 0	39 0	42 1	37 6 0
July	55 6	54 8	46 2 10	55 2	58 3	44 15 2	52 7	54 3	42 13 0	46 10	50 6	40 14 0	46 7	48 11	40 10 0
August	58 2	58 2	46 12 0	52 9	56 11	45 2 0	52 11	53 8	41 8 6	42 7	45 1	39 5 2	46 1	51 6	41 14 10
September	53 4	57 10	45 4 0	51 11	54 3	42 9 2	50 11	52 11	41 14 0	42 0	45 0	40 9 0	44 4	47 10	41 5 0
October	50 4	52 1	44 14 6	54 8	56 9	44 1 8	49 10	51 7	40 6 0	43 10	47 4	47 2 0	41 2	44 3	40 12 0
November	55 11	55 8	49 6 6	53 5	57 1	43 7 0	49 2	51 10	41 6 6	43 6	47 11	44 10 7	40 8	45 6	39 11 6
December	60 8	61 10	54 6 0	51 7	55 2	42 4 10	48 11	51 9	40 12 0	42 5	43 10	47 6 0	43 8	48 6	40 6 0
January	57 2	61 1	51 12 0	51 1	54 4	42 14 0	48 8	51 1	41 2 8	42 4	46 4	46 12 0	43 10	48 9	40 3 2
February	52 5	58 3	50 10 0	51 6	53 4	45 1 6	47 5	49 8	40 12 6	43 7	47 7	50 3 0	39 3	41 7	36 8 0
March	49 6	54 8	50 10 0	50 9	53 6	44 2 5	48 3	52 8	41 0 5	42 7	46 6	47 12 0	38 2	39 4	34 7 7

* International Year Book of Agricultural Statistics, Rome.

† Chamber of Commerce, Karachi.

NOTE.—Prices of Australian and La Plata wheat in the United Kingdom are in shillings per quarter of 480 lbs.

Prices of Indian wheat in Karachi are in rupees per candy of 686 lbs. (Basis 2% Balty. 1½% extraneous matter).

APPENDIX VII—*contd.*
Average monthly wholesale prices of Australian and La Plata wheats in the United Kingdom (C. I. F. Liverpool and/or London) and Indian wheat at Karachi† (ex-store).*

	1930-31.				1931-32.				1932-33.			
	La Plata.		Aust.		La Plata.		Aust.		La Plata.		Aust.	
	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.	Sh. d.	Rs. a. p.
April	38 5	33 3 6	40 7	33 3 6	20 7	22 1	22 1	19 0 5	24 4	27 2	21 8 6	
May	38 2	32 13 0	40 8	32 13 0	21 4	23 8	23 8	18 13 0	25 9	27 1	21 11 6	
June	37 0	30 6 9	39 5	30 6 9	20 1	22 7	22 7	17 1 0	24 0	25 3	23 2 0	
July	33 8	26 15 5	36 5	26 15 5	18 11	21 5	21 5	16 2 5	24 7	24 5	25 4 6	
August	35 1	27 12 0	36 8	27 12 0	18 0	19 5	19 5	17 11 6	26 6	27 7	27 14 0	
September	30 11	24 5 3	31 7	24 5 3	18 3	20 7	20 7	17 1 0	27 1	28 9	28 10 5	
October	26 10	21 6 10	29 2	21 6 10	22 5	25 7	25 7	18 0 9	25 11	26 11	29 6 0	
November	24 5	20 0 6	27 8	20 0 6	26 11	29 7	29 7	22 5 3	23 8	25 11	27 9 3	
December	22 7	17 12 0	26 7	17 12 0	25 8	28 6	28 6	24 1 0	22 6	24 2	28 12 9	
January	19 11	19 14 6	22 11	19 14 6	24 8	27 3	27 3	25 14 0	22 2	24 9	30 2 3	
February	21 0	19 5 6	21 10	19 5 6	26 0	27 11	27 11	24 3 0	20 6	23 7	30 13 0	
March	20 2	19 5 6	21 4	19 5 6	25 4	27 11	27 11	22 5 5	20 0	23 2	30 6 9	

* International Year Book of Agricultural Statistics, Rome.

† Chamber of Commerce, Karachi.

NOTE.—Prices of Australian and La Plata wheat in the United Kingdom are in shillings per quarter of 480 lbs.
 Prices of Indian wheat in Karachi are in rupees per candy of 656 lbs. (Basis 2% Barley, 1½% extraneous matter).

APPENDIX VII—contd.
Average monthly wholesale prices of Australian and La Plata wheats in the United Kingdom (C. I. F. Liverpool and/or London) and Indian wheat at Karachi † (ex-store).*

	1933-34.				1934-35.				1935-36.				1936-37.			
	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	La Plata.	Aust.	Karachi.	Rs. a. p.
April ..	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	Sh. d.	Sh. d.	Rs. a. p.	
May ..	20 4	24 1	27 9 3	17 6	22 2	19 13 0	24 1	28 4	22 7 6	n. q.	30 6	24 8 0	n. q.	30 6	24 8 0	
June ..	22 1	25 7	25 2 0	18 10	23 5	21 5 7	23 6	27 6	23 0 0	n. q.	30 0	23 13 6	n. q.	30 0	23 13 6	
July ..	22 4	25 11	25 12 5	20 1	25 0	21 12 6	23 4	27 0	22 8 9	n. q.	29 11 4	24 0 9	n. q.	29 11 4	24 0 9	
August ..	25 2	28 8	27 1 6	22 2	25 10	21 4 6	22 4	26 3	22 4 6	n. q.	36 10 1	25 14 3	n. q.	36 10 1	25 14 3	
September ..	22 11	26 3	24 10 2	25 7	29 9	21 14 10	25 3	26 9 1	22 6 7	34 6	39 7	27 7 3	34 6	39 7	27 7 3	
October ..	21 5	25 6	23 4 6	23 10	27 10	21 2 3	29 0	29 10 1	23 1 0	n. q.	39 2	29 3 6	n. q.	39 2	29 3 6	
November ..	18 11	n. q.	21 13 9	21 3	26 9	20 10 3	30 9 1	32 7 1	25 9 7	n. q.	..	..	n. q.	..	..
December ..	19 3	24 3	22 14 0	20 7	24 9	21 5 6	26 9 1	29 3	25 7 3	..	..	..	..	..	..
January ..	18 8	23 0	22 6 6	20 10	24 3	23 0 0	31 5	30 0	25 2 4	..	..	..	..	..	..
February ..	18 10	21 13 0	21 13 0	20 10	23 7	24 8 5	n. q.	31 7 1	24 12 5	..	..	..	..	..	..
March ..	18 3	22 4	22 3 0	20 1	24 0	23 5 9	n. q.	29 11 1	23 9 6	..	..	..	..	..	..
March ..	17 1	21 8	21 3 0	21 4	25 9	21 12 0	n. q.	30 1	24 11 0	..	..	..	..	..	..

* International Year Book of Agricultural Statistics, Rome.

† Chamber of Commerce, Karachi.

n. q.—no quotation.

NOTE.—Prices of Australian and La Plata wheat in the United Kingdom are in shillings per quarter of 480 lbs.
 Prices of Indian wheat in Karachi are in rupees per candy of 656 lbs. (Basis 2% Barley, 1½% extraneous matter.)

APPENDIX VIII.

Monthly imports of wheat by sea (British India).

(Thousand tons.)

	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Annual Total.
1920-21 7	.. 16	.. 75	.. 121	.. 98	.. 87	.. 36	..
1921-22 *	.. *	.. 1	.. *	.. 1	.. 1	.. 1	.. 1	.. *	.. 2	.. *	440
1922-23 *	.. *	.. *	.. *	.. *	.. 2	.. 2	.. 2	.. 2	.. 2	.. 2	18
1923-24 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	12
1924-25 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	4
1925-26 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	36
1926-27 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	41
1927-28 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	67
1928-29 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	554
1929-30 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	355
1930-31 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	233
1931-32 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	112
1932-33 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	34
1933-34 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	18
1934-35 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	7
1935-36 *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	.. *	14

* Below 500 tons.

NOTE.—The annual totals shown in this statement will not compare exactly with Appendix X since the former represent the sum of monthly imports expressed to the nearest thousand tons.

SOURCE.—Accounts relating to the sea-borne Trade and Navigation of British India.

APPENDIX IX.
Import and export trade of wheat at stations adjacent to land frontier routes.
(In tons.)

Month.	Import.						Export.					
	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.
April ..	212	296	545	1,878	228	370	3,729	2,727	1,658	2,562	3,453	3,152
May ..	566	586	1,068	2,177	436	456	3,121	3,139	3,018	4,566	2,905	2,972
June ..	1,040	657	1,034	1,312	713	808	4,870	5,615	3,930	5,551	2,230	2,371
July ..	819	720	1,834	1,915	1,098	1,239	6,113	4,280	2,796	4,986	2,750	2,437
August ..	859	510	2,023	1,546	1,034	1,246	6,688	5,525	3,555	3,299	2,412	1,045
September ..	482	207	1,733	996	618	943	4,541	3,414	2,618	3,287	3,398	3,399
October ..	363	200	1,170	775	496	1,041	4,741	3,913	3,695	2,948	2,805	2,423
November ..	387	522	498	694	480	683	3,845	2,948	2,370	2,926	3,092	1,113
December ..	357	429	729	454	523	718	3,467	3,008	1,977	2,583	3,233	1,375
January ..	343	204	840	283	396	602	4,496	1,468	1,946	2,351	2,517	1,366
February ..	233	149	751	241	239	203	2,631	1,628	1,134	3,161	1,894	1,594
March ..	111	83	1,190	166	224	255	3,669	3,662	2,016	2,794	3,026	3,529
Total ..	5,772	4,563	13,415	12,437	6,485	8,564	51,911	41,327	30,713	41,034	33,715	27,666
A ..	212	126	875	965	246	505	5,362	4,062	4,437	4,163	6,698	1,890
B ..	1,226	2,241	7,811	5,104	3,646	5,290	43,701	33,658	23,072	35,381	24,291	22,987
C ..	4,334	2,196	4,729	6,368	2,593	2,769	2,848	3,607	3,204	1,490	2,726	2,789

A.—Nushki-Durdap section, i.e., Trade with Persia, Western and Southern Afghanistan.

B.—North-West Frontier Province, Punjab, Northern and Eastern Afghanistan, Kashmir, and through them with Central Asia and Turkistan.

C.—United Provinces, Bihar and Orissa, Bengal and Assam, i.e., Trade with Tibet, Nepal, Sikkim and Bhutan.

Source.—Trade at Stations adjacent to Land Frontier Routes.

APPENDIX X.

Area, production and total available supplies of wheat and imports and exports (including re-exports) of wheat and wheat flour by sea.

(000 omitted.)

Fiscal year.	Area.*	Pro-duction.*	Imports.		Exports.		Total supplies available for consumption (including seed).
			Wheat.	Flour.	Wheat.	Flour.	
	(Acres)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1900-01 ..	18,768	5,357	28	1	3	25	5,347
1901-02 ..	23,865	7,094	11	1	366	26	6,703
1902-03 ..	23,446	6,091	..	1	515	36	5,526
1903-04 ..	23,395	7,971	1	1	1,296	41	6,618
1904-05 ..	28,414	9,641	..	..	2,150	52	7,417
1905-06 ..	28,470	7,582	23	1	938	45	6,604
1906-07 ..	26,357	8,570	10	..	801	41	7,720
1907-08 ..	20,213	8,492	13	2	880	37	7,575
1908-09 ..	22,911	6,125	29	7	110	30	6,011
1909-10 ..	26,236	7,639	..	2	1,051	35	6,541
1910-11 ..	28,107	9,634	..	3	1,266	40	8,315
1911-12 ..	30,565	10,062	2	4	1,361	52	8,635
1912-13 ..	30,518	9,829	3	3	1,660	69	8,077
1913-14 ..	30,043	9,853	..	4	1,202	79	8,544
1914-15 ..	28,475	8,358	1	3	706	54	7,580
1915-16 ..	32,475	10,087	..	..	653	59	9,350
1916-17 ..	30,320	8,652	..	..	749	70	7,803
1917-18 ..	32,941	10,236	2	..	1,454	72	8,681
1918-19 ..	35,487	9,922	55	..	480	31	9,453
1919-20 ..	23,798	7,507	148	..	16	48	7,570
1920-21 ..	29,949	10,122	..	..	238	61	9,798
1921-22 ..	25,784	6,706	440	2	81	64	6,975
1922-23 ..	28,207	9,830	19	3	220	50	9,561
1923-24 ..	30,852	9,974	12	1	638	57	9,267
1924-25 ..	31,181	9,660	4	..	1,112	78	8,441
1925-26 ..	31,778	8,866	35	..	212	67	8,595
1926-27 ..	30,471	8,696	40	..	176	59	8,476
1927-28 ..	31,303	8,973	69	..	300	60	8,656
1928-29 ..	32,193	7,791	562	..	115	54	8,161
1929-30 ..	31,973	8,592	357	..	17	51	8,860
1930-31 ..	31,654	10,469	232	..	197	47	10,438
1931-32 ..	32,189	9,306	111	..	22	43	9,334
1932-33 ..	33,803	9,024	33	..	2	21	9,026
1933-34 ..	32,976	9,455	18	..	2	13	9,453
1934-35 ..	35,992	9,424	7	..	11	12	9,404
1935-36 ..	34,491	9,725	13	..	10	18	9,702

* The statistics of area and production mentioned against each year are those of the preceding year in order to correlate them with import and export figures.

NOTE.—(a) The data regarding area and production have been extracted from "Estimates of Area and Yield of Principal Crops in India", and do not include certain minor areas. For this reason the totals given in the above statement do not agree with those given in Appendices 1 and 2.

(b) Imports and Exports taken from "Sea Borne Trade of British India". Figures of Government Stores are not included.

APPENDIX XI.

Monthly exports of wheat by sea.

(Thousand tons.)

Year.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Annual total.
1920-21	1	1	1	1	1	1	1	9	36	80	53	55	240
1921-22	19	12	15	24	8	*	1	*	*	*	*	*	79
1922-23	*	91	*	*	*	*	1	46	58	64	29	21	219
1923-24	57	15	207	142	45	37	12	29	16	1	1	1	639
1924-25	*	23	120	195	76	35	128	114	87	108	158	73	1,110
1925-26	9	4	94	19	18	23	6	5	4	8	2	1	212
1926-27	1	4	39	56	26	4	14	17	6	7	1	1	176
1927-28	*	2	77	131	38	15	17	15	2	1	1	1	300
1928-29	6	10	63	25	6	1	1	*	*	1	*	*	113
1929-30	*	*	*	1	7	2	*	*	*	*	*	*	10
1930-31	*	1	48	62	45	20	12	3	2	3	1	*	197
1931-32	*	*	8	5	4	*	1	1	*	*	*	*	19
1932-33	*	*	*	*	*	*	*	*	*	*	*	*	..
1933-34	*	*	*	*	*	*	*	*	*	*	*	*	..
1934-35	*	*	*	*	6	2	1	1	*	*	*	*	19
1935-36	*	*	*	*	*	2	3	3	*	*	*	*	9
1936-37	*	1	5	4	9	..	..	..	..	..	..	..	19

*Below 500 tons.

NOTE.—The annual totals shown above do not agree exactly with those given in Appendix X since the former figures represent monthly exports rounded off to the nearest thousand tons.

SOURCE.—Accounts relating to the Sea-borne Trade and Navigation of British India.

APPENDIX XII.

EXPORTS OF WHEAT FLOUR FROM BRITISH INDIA*.

To British possessions and the share of the British Empire in the total exports to all destinations.

(Thousand tons.)

Year†.	Aden and depend-encies.	Bahrein Islands.	Ceylon.	Straits Settlements.	Zanzibar.	Kenya.	Mauritius.	Other British possessions ‡.	Total British Empire.	Total ex-ports.	Share of British Empire.
1925-26	8.1	2.0	5.0	2.7	2.8	2.6	4.5	11.1	38.8	68.6	56.5
1926-27	7.3	1.9	4.0	3.1	3.1	3.3	3.3	5.3	31.3	60.1	52.0
1927-28	9.1	2.3	4.1	3.2	3.1	3.0	4.2	2.2	31.1	61.1	50.9
1928-29	7.7	2.1	2.0	3.4	2.7	3.2	2.8	1.3	25.2	54.5	46.4
1929-30	6.0	1.9	1.3	3.4	3.1	3.5	2.7	2.0	24.0	51.0	47.0
1930-31	5.7	1.7	1.3	3.5	2.9	3.1	4.4	1.2	23.9	47.1	50.7
1931-32	5.6	.6	.8	3.2	2.7	3.1	1.3	6.5	23.9	43.0	56.6
1932-33	3.5	.2	.3	1.6	1.5	1.7	.3	3.1	12.1	21.0	57.6
1933-34	2.8	.2	.3	1.6	.6	1.4	§	.6	7.7	12.7	60.6
1934-35	1.7	.2	.5	2.4	.5	1.5	.1	.7	7.6	11.8	64.5

* Adapted from the Annual Statement of Sea-Borne Trade of British India. † Year beginning on 1st April and ending on 31st March.

‡ United Kingdom, Gibraltar, Iraq, Federated Malay States, Hong Kong, Natal, Tanganyika, Somaliland, Anglo Egyptian Sudan, Seychelles.

§ Below 100 tons.

APPENDIX XIII.
EXPORTS OF WHEAT FLOUR FROM BRITISH INDIA.*
To foreign countries and the share of each province in the total exports to all destinations.
 (Thousand tons.)

Year†.	Maskat Territory and Trucial Oman.	Other States in Arabia.	Iran.	Italian East Africa.	Egypt.	Other Foreign Countries.†	Total Foreign Countries.	Total exports.	Share of—		
									Bengal.	Bombay.	Sind.
1925-26	3.0	2.6	8.4	.9	14.3	.6	29.9	68.6	2.3	21.8	44.6
1926-27	2.9	5.7	3.7	.3	15.8	.4	28.8	60.1	2.3	21.4	36.4
1927-28	3.2	9.3	2.1	2.1	11.2	2.1	30.0	61.1	2.1	22.1	36.8
1928-29	3.1	8.3	1.1	3.0	11.8	2.0	29.2	54.5	2.1	18.1	34.2
1929-30	3.1	10.2	.7	3.6	6.8	2.5	26.9	50.9	2.6	21.6	26.8
1930-31	3.0	10.1	.4	3.4	6.2	1.3	23.2	47.1	2.6	17.6	26.7
1931-32	3.1	10.7	§	3.2	.8	1.3	19.1	43.0	2.2	15.6	24.9
1932-33	2.7	3.9	§	1.3	§	.9	8.9	21.0	.9	6.4	13.6
1933-34	2.1	2.2	§	.2	§	.5	5.0	12.7	.6	5.6	6.3
1934-35	2.0	1.4	§	.3	§	.5	4.2	11.8	.8	5.1	5.8

* Adapted from the Annual Statement of Sea-borne Trade in British India.
 † Year beginning on 1st April and ending on 31st March.
 § Iraq, Hanjam Islands, Java, Siam, Indo China, Portuguese, East Africa, French Somaliland, United States.
 § Below 100 tons.

APPENDIX XIV.

Net available supplies and per capita consumption of wheat in India.
(3 years' averages.)

	Average produc- tion.	Imports.		Exports.		Seed.	Net available supplies.	Popula- tion (1931).	Per capita consump- tion.
		Wheat.	Flour†.	Wheat.	Flour.†				
	000 tons.	000 tons.	000 tons.	000 tons.	000 tons.	000 tons.	000 tons.	000	lbs.
<i>British Provinces.</i>									
1. Punjab	3,335	..	..	341	90	236	2,668	28,490	210
2. United Provinces	2,623	72	51	107	22	368	2,249	48,873	103
3. Central Provinces	728	12	6	72	1	139	534	17,961	67
4. Bombay *	446	219	20	13	16	85	571	22,460	57
5. Sind *	328	118	..	167	92	55	132	4,115	72
6. Bihar and Orissa	491	34	35	8	11	54	487	37,078	29
7. North-West Frontier Province	238	18	6	..	..	23	239	2,435	221
8. Bengal *	41	216	28	1	31	5	248	50,114	12
9. Madras †	2.4	18	53.5	0.6	2.7	0.5	70.1	46,740	3.4

APPENDIX XV.
Approximate annual consumption of wheat by large roller mills.

Province or State.	Number of mills in operation.	Quantity of wheat consumed.	Products manufactured.				Remarks.
			Maida.	Suji.	Ata.	Bran.	
		Tons.	Tons.	Tons.	Tons.	Tons.	
Punjab ..	13	250,000	67,500	45,000	100,000	37,500	Of a total of seventeen mills four were not working in 1935. At least two mills in this province are inoperative.
United Provinces ..	14	107,000	23,000	2,000	66,000	16,000	
Bihar and Orissa ..	7	63,000	17,000	1,300	36,600	8,100	
Bombay ..	12	120,000	78,000	..	18,000	24,000	One large mill in Bombay City is silent.
Bengal ..	11	177,000	97,600	8,800	44,100	26,500	
Sind ..	4	140,000	70,000	7,000	32,200	30,800	Two mills closed temporarily,
Delhi ..	3	45,000	22,500	2,250	13,500	6,750	Since the summer of 1936 two of the three mills have closed down in accordance with a local pooling arrangement.
Patiala ..	2	30,000	10,500	4,500	10,800	4,200	
Indore ..	1	3,000	1,500	50	1,060	390	
Total ..	67	935,000	387,600	70,900	322,260	154,240	
Percentage ..	..	..	41	8	34	17	

APPENDIX XVI.

Results of tests relative to the behaviour of certain qualities of ata in the preparation of chapatis.

Quality of ata used.	Total weight of chapatis (actual).	Estimated number of chapatis weighing 4 tolas each.	Percentage of excess of weight of the finished chapatis over the weight of ata used.
	Sr. Ch. tolas		
<i>Triticum vulgare.</i>			
1. Ata prepared from <i>Sharbatī</i> wheat (ground in stone mills worked by electricity at Delhi).	1 6 0	28	40·6
2. Ata imported from Mian Channun (Punjab) prepared from <i>Sharbatī</i> wheat (ground in stone mills worked by water power).	1 6 0	27½	37·5
3. A mixture of second and third grade <i>atas</i> manufactured (by a modern roller mill at Delhi).	1 6 0	27½	37·5
4. Ata prepared from local white wheat (ground in stone mills worked by electricity at Delhi).	1 3½ 0	24½	21·8
5. High Grade Pissi (Jubbulpore, Central Provinces).	1 6 1½	27·88	39·4
<i>Triticum durum.</i>			
6. Bakhshi (<i>Durum</i>) (Central Provinces).	1 6 2	28	40
7. Khapli (<i>Emmer</i>) (Bombay) ..	1 6 2½	28·12	40·6
8. Bakhshi (<i>Durum</i>) (Bombay) ..	1 7 0	28·74	43·7
9. Red-Bijapore (<i>Durum</i>) (Bombay)	1 6 3	28·24	41·2

NOTE.—Quantity of *ata* used in each case—1 seer.

APPENDIX XVII.

Average official and trade wholesale prices at certain markets during 1934.*

	Punjab.						Central Provinces.						Bombay.			
	Amritsar.			Lyallpur.			Damoh.			Jubbulpore.			Bombay City.		Bijapur.	
	Official.		Trade.	Official.		Trade.	Official.		Trade.	Official.		Trade.	Official.		Trade.	Trade.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January	2 4 0	2 3 9	2 9 0	2 0	2 4 0	2 5 0	2 4 0	2 5 0	2 13 0	2 12 0	2 13 0	2 13 0	3 14 8	2 13 0	2 10 0	2 6 5
February	2 8 0	2 2 6	2 0 6	2 2 0	2 0 0	2 3 0	2 0 0	2 3 0	2 12 0	2 9 0	2 12 0	2 12 0	3 11 3	3 1 2	2 12 8	2 12 11
March	2 4 0	2 2 6	1 12 0	1 10 0	1 14 0	2 5 0	1 14 0	2 5 0	2 8 0	2 8 0	2 8 0	2 8 0	3 10 5	2 14 11	2 4 11	2 6 5
April	2 6 0	2 4 0	1 13 6	1 13 6	2 1 0	2 3 0	2 1 0	2 3 0	2 8 0	2 5 0	2 8 0	2 8 0	3 9 7	2 12 4	..	2 3 5
May	2 7 0	2 5 3	2 1 3	1 15 6	2 3 0	2 4 0	2 3 0	2 4 0	2 11 0	2 9 0	2 11 0	2 11 0	3 10 5	2 14 11	2 8 1	2 4 2
June	2 8 0	2 4 3	2 1 0	2 1 6	2 2 0	2 3 0	2 2 0	2 3 0	2 10 0	2 9 0	2 10 0	2 10 0	3 10 5	3 0 5	2 9 7	2 13 4
July	2 9 0	2 4 6	1 13 9	2 0 0	2 1 0	2 1 0	2 1 0	2 1 0	2 9 0	2 6 0	2 9 0	2 9 0	3 12 11	2 14 11	2 4 6 1/2	3 3 8
August	2 8 0	2 3 0	2 0 6	2 0 9	2 2 0	2 2 0	2 2 0	2 2 0	2 9 0	2 9 0	2 9 0	2 9 0	3 13 10	2 15 8	2 11 11	3 4 8
September	2 6 0	2 5 6	1 14 0	1 14 6	2 2 0	2 2 0	2 2 0	2 2 0	2 10 0	2 9 0	2 10 0	2 10 0	3 13 0	2 13 6	2 12 3	3 1 5
October	2 12 0	2 8 0	1 13 9	1 14 9	2 2 0	2 3 0	2 2 0	2 3 0	2 10 0	2 9 0	2 10 0	2 10 0	3 14 8	2 12 9	3 5 3	2 12 7
November	2 8 0	2 8 0	2 3 0	2 3 6	2 3 0	2 3 0	2 3 0	2 3 0	2 12 0	2 10 0	2 12 0	2 12 0	4 1 2	2 13 6	3 1 1	..
December	2 8 0	2 3 3	2 1 0	2 2 9	2 8 0	2 3 0	2 8 0	2 3 0	2 12 0	2 10 0	2 12 0	2 12 0	4 3 9	3 1 2	2 15 4	3 2 9

* Amritsar quotations from April to December refer to 1935 and January to March to 1936.

APPENDIX XVIII.

Red and white wheat prices (per maund) in Fenton Ganj Market Jullundur City.

Date.	May 1935.		June 1935.		July 1935.	
	Red Wheat.	White Wheat.	Red Wheat.	White Wheat.	Red Wheat.	White Wheat.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1	2 2 0	2 5 0	2	2	2	2
2 .. ..	..	..	2 1 9	2 3 6	2 0 9	2 4 0
3 .. ..	..	..	2 2 3	2 4 4	2 1 6	2 2 4
4	2 1 6	2 5 6	2 2 2	2 4 6	2 0 11	2 3 9
5 .. ..	..	..	2 2 6	2 4 0	2 1 0	2 3 3
6	2 1 8	2 6 3	2 1 7	2 4 5	2 0 11	2 4 2
7 .. ..	..	..	2 1 9	2 3 11	2 1 6	2 5 0
8	2 1 3	2 5 0	2 1 5	2 4 5	2 1 2	2 3 8
9	2 2 5	2 3 0	2 1 4	2 4 3	..	..
10	2 2 6	2 4 6	2 1 6	2 4 0	2 1 0	2 4 3
11	2 2 5	2 3 3	2 1 0	2 3 0	..	..
12	2 2 6	2 5 0	2 2 1	2 4 0	..	..
13	2 2 0	2 3 8	2 2 4	2 4 4	2 1 1	2 3 11
14	2 2 0	2 5 0	2 2 3	2 4 6	..	..
15	2 0 9	2 4 0	2 2 6	2 5 6	2 0 3	2 6 0
16	2 2 3	2 5 0	2 1 11	2 6 0	..	..
17	2 2 4	2 4 9	2 2 2	2 4 11	2 1 3	2 3 6
18	2 2 8	2 3 11	2 1 9	2 4 0	..	..
19	2 2 5	2 4 0	2 1 10	2 5 0	2 1 3	2 2 6
20	2 2 0	2 4 6	2 1 6	2 3 4	..	..
21	2 2 5	2 4 5	2 1 9	2 4 11	2 1 0	2 4 6
22	2 2 3	2 4 0	2 2 0	2 3 4	..	..
23 .. ..	..	..	2 1 7	2 3 4	..	..
24	2 2 10	2 4 6	2 1 0	2 5 7	..	..
25 .. ..	..	..	..	..	..	..
26	2 2 0	2 4 2	2 1 9	2 4 6	..	..
27	2 1 6	2 4 2	..	..	..	..
28	2 0 9	2 3 3	2 1 3	2 4 1	..	..
29	2 2 0	2 5 0	2 0 8	2 3 9	..	..
30	2 1 11	2 3 3	..	..	..	..
31	2 1 9	2 3 11	..	..	..	..
Average ..	2 2 0	2 4 4	2 1 9	2 4 2	2 1 1	2 3 11

APPENDIX XIX.

Average monthly wholesale price of wheat (per maund of 82.27 lbs.) during 1931-35 (Basia—barley 2% and dist 1½% mutual).

Years and Markets.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
1931.													
Lyaipur	Ra. a. p. 2 3 0	Ra. a. p. 2 0 3	Ra. a. p. 1 14 0	Ra. a. p. 1 10 0	Ra. a. p. 1 10 6	Ra. a. p. 1 8 6	Ra. a. p. 1 8 9	Ra. a. p. 1 11 6	Ra. a. p. 1 9 0	Ra. a. p. 1 14 0	Ra. a. p. 2 1 0	Ra. a. p. 2 8 0	Ra. a. p. 1 13 6
Karachi	2 6 10	2 6 9	2 7 4	2 6 7	2 5 8	2 2 1	2 0 3	2 3 5	2 2 1	2 4 1	2 12 8	3 8 1	2 6 3
Calcutta *	3 2 0	3 4 0	3 0 0	2 10 6	2 12 0	2 12 0	2 13 6	2 14 0	2 8 6	2 10 0	2 2 0	3 6 6	2 14 7
Bombay	2 6 1	2 5 6	2 2 9	2 1 2	2 0 9	1 12 9	1 13 9	2 2 6	1 15 3	2 1 3	2 6 8	2 8 6	2 2 4
(Karachi Bangle)	2 9 1	2 12 9	2 12 0	2 12 9	2 11 3	2 7 7	2 4 8	2 6 10	2 4 8	2 6 10	2 12 9	3 3 4	2 9 9
1932.													
Lyaipur	2 5 6	2 3 0	2 0 0	1 15 6	2 1 6	2 2 9	2 8 3	2 13 6	2 14 3	2 15 3	2 14 0	2 15 9	2 7 9
Karachi	3 3 9	3 0 4	2 12 9	2 11 1	2 11 5	2 14 3	3 2 6	3 7 9	3 9 2	3 10 9	3 7 2	3 9 7	3 3 0
Calcutta *	3 12 3	3 9 0	3 8 0	3 5 6	3 1 3	3 4 3	3 9 3	3 14 3	4 1 0	4 2 0	3 14 6	3 15 0	3 10 8
Bombay	2 11 3	2 9 10	2 7 0	2 3 9	2 6 4	2 9 0	2 12 10	3 2 9	3 3 6	3 4 0	3 0 6	3 2 0	2 10 1
(Karachi Bangle)	3 8 0	3 8 9	3 11 11	3 5 11	3 0 8	3 2 8	3 5 11	3 13 3	3 14 9	3 13 8	3 12 2	3 12 11	3 9 3
1933.													
Lyaipur	3 2 0	3 2 3	3 0 0	2 14 0	2 12 0	2 11 9	2 14 0	2 10 0	2 5 3	2 5 0	2 4 6	2 2 6	2 10 11
Karachi	3 12 6	3 13 8	3 12 10	2 7 2	3 2 2	3 3 7	3 6 3	3 1 4	2 14 7	2 11 9	2 13 9	2 12 10	3 0 3
Calcutta *	4 4 0	4 5 0	3 14 6	3 10 3	3 7 3	3 12 0	3 12 0	3 11 0	3 7 0	3 3 0	3 6 6	3 3 9	2 10 8
Bombay	3 3 6	3 5 0	3 2 3	2 10 10	3 0 2	3 1 6	3 4 6	2 13 6	2 7 1	2 5 4	2 6 1	2 2 1	2 10 6
(Karachi Bangle)	3 15 10	4 0 7	3 12 11	3 5 6	3 8 6	3 7 9	3 12 11	3 7 0	3 4 1	3 0 5	3 4 1	2 14 11	3 7 11
1934.													
Lyaipur	2 0 6	2 2 0	1 13 6	1 12 3	2 1 0	2 1 0	1 15 0	2 0 9	1 13 9	1 14 6	2 1 0	2 2 3	1 15 9
Karachi	2 11 8	2 12 5	2 10 5	2 7 7	2 10 8	2 11 7	2 10 4	2 11 10	2 10 4	2 9 3	2 10 8	2 14 0	2 10 11
Calcutta *	3 1 3	3 3 0	3 3 6	3 0 9	3 2 6	3 3 0	3 2 0	3 2 6	3 0 3	2 15 0	2 14 6	3 5 0	2 1 9
Bombay	2 0 9	2 2 7	2 0 4	1 15 6	2 6 8	2 8 4	2 7 7	2 7 6	2 3 10	2 4 1	2 4 7	2 7 8	2 4 5
(Karachi Bangle)	2 13 2	3 1 2	2 14 11	2 12 4	2 14 11	3 0 5	2 14 11	2 15 8	2 13 6	2 12 9	2 13 6	3 1 2	2 14 6
1935.													
Lyaipur	2 6 7	2 1 3	1 15 9	2 2 1	2 2 9	2 2 10	2 2 0	2 1 3	2 3 4	2 8 6	2 8 1	2 6 10	2 3 9
Karachi	3 1 1	2 14 9	2 10 6	2 13 0	2 14 0	2 13 2	2 12 7	2 12 10	2 14 2	3 2 7	3 2 1	3 2 4	2 14 10
Calcutta *	3 8 3	3 7 0	3 3 0	3 4 0	3 5 6	3 4 3	3 5 0	3 4 3	3 6 0	3 9 0	3 9 6	3 8 0	3 6 2
Bombay	2 9 6	2 6 8	2 2 4	2 4 2	2 8 8	2 9 7	2 9 8	2 8 1	3 0 5	2 1 1	2 3 7	2 10 2	2 8 7
(Karachi Bangle)	3 3 4	3 2 7	2 14 11	3 1 2	3 2 2	3 1 2	3 0 2	3 0 5	3 0 9	3 6 7	3 7 0	3 5 2	3 2 6

* Terms at Calcutta are non-mutual.

Norm. — Calcutta prices are for Punjab wheat and Bombay for Karachi—Bangle.

APPENDIX XX.

Average monthly wholesale prices (per maund of 82.2/7 lb.) of *T. Durum* and *T. Vulgare Wheats*.

Market.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.
Hyderabad (Dn.) (Bener Wheat— <i>T.</i> <i>durum</i>).	1931 4 1 10 1932 4 2 2 1933 4 4 5 1934 4 5 8 1935 4 2 8	3 15 10 3 15 2 4 5 5 4 3 3 4 3 2	3 14 9 4 6 3 4 9 9 4 5 8 4 0 8	4 1 5 4 5 1 4 7 3 4 9 1 4 0 5	3 15 4 4 5 1 4 6 5 4 6 5 3 15 1	4 0 11 4 0 1 4 1 10 4 3 11 3 14 4	4 3 6 4 1 9 4 4 0 4 2 11 4 2 8 3 14 10	4 4 9 4 11 8 4 2 11 4 7 4 3 14 7	4 3 3 4 11 3 3 15 8 4 8 5 3 13 3	4 4 6 4 9 9 4 3 2 4 9 6 3 12 0	4 6 11 4 8 11 4 3 7 4 2 6 3 15 8	5 8 3 4 5 5 4 7 8 4 2 1 4 0 5
Hubli (Bombay) (White wheat— <i>T.</i> <i>durum</i>).	1931 4 7 6½ 1932 4 2 8 1933 3 12 4½ 1934 3 8 10 1935 3 11 8	4 1 8 3 12 5 3 14 6½ 3 6 8½ 3 11 8	3 15 0 3 8 2 3 1 9½ 3 4 0 3 11 8	3 9 11 2 10 8 3 11 4 3 12 5½	3 5 3½ 3 14 1 2 15 7 3 14 5½ 3 13 3	3 3 2 3 11 6 3 4 6 4 1 7 3 13 3	3 1 4 3 8 11 3 4 6 3 9 1 3 13 3	3 7 5 3 8 11 3 0 9 3 9 1 3 13 3	3 12 5 3 11 6 3 4 6 3 12 9½ 3 13 3	3 7 5 3 14 1 3 8 10 4 0 6½ 3 14 1½	3 7 5 3 14 1 3 4 6 3 5 5 3 10 8½	3 5 3½ 3 12 5 3 0 9 3 11 8 3 5 11
Bijapur (Bombay) (Red Wheat— <i>T.</i> <i>durum</i>).	1931 3 2 3 1932 3 0 6 1933 2 6 5 1934 3 1 5 1935 3 1 5	2 14 10 3 3 8 2 12 11 2 14 4	2 13 4 2 10 2 2 6 5 3 1 5	2 11 2 2 11 2 2 3 5 3 3 2	3 2 3 2 8 8 2 4 2 3 2 9	2 8 8 2 14 6 2 13 4 3 0 1	2 6 11 2 10 2 3 3 8 2 15 3	3 1 5 2 12 7 3 4 8 3 0 1	3 6 3 3 4 6 3 1 5 3 7 4	2 14 1 3 9 7 2 6 5 2 12 7 ..	2 14 10 .. 2 6 5	2 13 4 2 6 5 3 2 9 ..
Harda (C. P.) (Jalasia — <i>T. durum</i>).	1931 5 3 6 1932 3 4 0 1933 2 15 6 1934 2 12 6	4 8 6 3 4 0 2 9 0 3 0 0	4 12 0 3 0 6 3 1 6 2 11 6	3 13 6 2 14 0 3 3 0 2 15 0	3 3 6 2 8 0 3 4 6 2 12 6	2 9 0 2 11 0 3 3 0 2 11 0	2 9 0 3 0 0 2 14 6 2 12 0	3 3 0 2 14 0 2 13 0 2 13 0	3 1 0 2 14 0 3 2 0 2 13 0	2 15 0 3 1 0 3 2 0 3 5 0	2 15 0 3 3 6 3 2 0 3 0 0	3 3 6 3 0 0 3 0 0
Bombay City (Karachi Bangle— <i>T. vulgare</i>).	1931 2 9 1 1932 3 8 0 1933 3 15 10 1934 2 13 2 1935 3 3 4	2 12 9 3 8 9 4 0 7 3 1 2 3 2 7	2 12 0 3 12 6 3 12 11 2 14 11 2 14 11	2 12 9 3 5 11 3 5 6 2 12 4 3 1 2	2 11 3 3 0 8 3 6 6 2 14 11 3 2 2	2 7 7 3 2 8 3 7 9 3 1 2 3 1 2	2 4 8 3 5 11 3 12 11 2 14 11 3 0 2	2 6 10 3 13 3 3 7 0 3 5 8 3 0 5	2 4 8 3 14 9 3 4 1 2 13 6 3 0 9	2 6 10 3 13 8 3 4 1 2 12 9 3 6 7	2 12 9 3 12 2 3 4 1 2 13 6 3 7 0	3 3 4 3 12 11 2 14 11 3 1 2 3 5 2

APPENDIX XXI.

Number of occasions on which the nearest "futures" price was at a premium (+) or discount (—) as compared with "ready" at certain important markets.

	May.		June.		July.		September.		October.		November.		December.		January.		February.		March.	
	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
Calcutta—																				
1931	1	8					4													
1932	2	9					3													
1933	8	3					4													
1934	7	4					5													
1935																				
Bombay—																				
1931																				
1932	5	5					4													
1933	6	5					2													
1934	6	5					5													
1935	10	1					2													
Karachi—																				
1931	2	3			5	1	4		3		4		4		4				1	2
1932	3		2		2	9	6		4		4		4		2				2	1
1933		4				11	4		1		4				2				1	1
1934	1	1			6	5	5		3		2		2		2				2	1
1935	4		5		6	6	3		2		2		1		2				1	
Lydelpur—																				
1931					8	2			8				4				1		4	1
1932					6	2			5				6				4		4	
1933					1	9			8				5				5		4	
1934					7	2			6				5				5		4	
1935					7	3			7				5				5		4	
Rayer—																				
1931			4	2			2						1				1			
1932			4	4			4						4				3		4	
1933			1	7			5						3				5		5	
1934			7	1			6						4				1		4	
1935			7	1			6						2				3		1	
1936				1			6						2				4			

APPENDIX XXII.

Physical characteristics of the wheats grown in India (results of 1,400 samples).

	Dirt.		Oilseeds and other non-food grains.		Barley and other food grains.		Weevilled, Damaged and Shrivelled.		White.		Red.		Durum.	
	Max. %	Avt. %	Max. %	Avt. %	Max. %	Avt. %	Max. %	Avt. %	Max. %	Avt. %	Max. %	Avt. %	Max. %	Avt. %
BRITISH PROVINCES.														
1. Punjab—														
Canal Colonies ..	1.89	.23	3.39	.77	7.73	1.01	23.91	4.50	100	94.1	37.94	5.3	5.98	.6
East and South East ..	1.13	.22	4.42	.79	23.49	2.42	23.95	5.36	100	82.64	99.70	17.31	9.91	.05
South & South West ..	1.30	.26	3.19	.76	20.64	3.32	12.78	3.84	100	83.48	99.16	16.52	..	..
North ..	1.29	.50	7.16	.84	13.02	2.47	16.04	3.34	99.90	57.15	99.59	42.03	98.8	2.8
2. United Provinces—														
Western ..	4.91	.36	4.96	.92	8.18	1.77	22.46	4.56	99.69	78.31	98.98	17.47	100	4.22
Central ..	5.20	.41	6.06	1.08	9.66	1.48	13.76	3.59	99.89	79.46	92.43	18.53	100	2.01
Eastern ..	5.47	.91	2.78	1.16	6.65	1.41	17.21	3.13	99.12	68.75	99.06	31.25	..	..
3. Central Provinces ..	7.49	1.97	5.62	.60	2.15	.21	58.27	7.66	99.93	61.02	97.52	12.11	100	20.87
4. Bombay ..	9.96	1.10	1.65	.29	10.65	.27	10.14	2.24	99.77	18.76	100	15.08	100	66.16
5. Sind ..	6.37	1.12	4.67	.99	12.50	1.11	13.17	2.92	99.95	83.25	100	10.43	100	4.32
6. Bihar and Orissa ..	1.86	.73	4.28	1.46	16.64	2.85	12.50	4.64	98.74	66.59	97.71	33.41	..	..
7. North-West Frontier Province ..	3.77	1.02	2.45	1.72	2.76	1.27	8.10	6.05	97.39	11.98	99.94	87.78	1.60	.34
8. Bengal ..	1.60	.55	1.21	.54	2.11	.70	8.07	6.48	97.23	41.53	100	58.46	..	..
INDIAN STATES.														
1. Rajputana ..	7.85	1.94	3.38	.60	41.52	1.39	12.14	7.05	98.97	37.89	100	22.79	100	39.31
2. Central India ..	3.77	.68	17.33	.66	8.23	.17	14.42	1.20	99.80	34.77	100	15.32	100	49.90
3. Hyderabad Deccan ..	3.63	1.39	1.42	.49	..	..	32.13	12.04	99.17	39.83	100	21.97	100	38.19
4. Kashmir ..	.96	.23	2.43	.48	.47	.09	5.08	1.25	100	49.41	100	50.48	..	.11

APPENDIX XXIII.

Merchandising charges on wheat in wholesale assembling markets in the Punjab.—Colony markets.

(Per 100 rupees.)

Items.	Lyall- pur.	Jaran wala.	Chak Jhumra.	Toba Tek Singh.	Sangla Hill.	Sargo- dha.	Sillan- wali.	Okara.	Arif- wala.	Bure- wala.	Vihari.	Khanewal Jhansia & Mian- channu.	Average.
	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.
<i>Payable by Seller.</i>													
Handling upto Weightment	0 11 9	0 13 3	0 8 6	0 9 3	0 8 9	1 0 3	0 13 6	0 12 9	0 15 6	1 2 9	0 8 3	0 3 9	0 11 8
Karda, Dhalla and Dosa	..	..	..	..	..	..	..	0 9 0	..	..	..	..	0 0 9
Commission	0 12 0	1 0 0	0 12 0	1 2 6	1 2 0	0 10 0	0 9 9	0 12 0	1 0 0	1 0 0	1 2 9	1 7 6	0 15 2
Brokenage ..	0 1 3	0 1 3	0 1 3	0 1 0	0 1 6	0 1 3	0 1 3	..	0 1 3	0 1 3	0 1 3	0 1 3	0 1 2
Charity ..	0 1 0	0 1 9	..	0 0 9	..	0 0 3	0 1 6	0 1 3	0 1 3	0 1 3	0 1 3	0 1 3	0 1 0
Miscellaneous	0 5 0	0 3 9	..	0 1 0	..	0 1 3	0 2 6	0 3 0	0 10 3	0 9 0	..	..	0 3 0
Total	1 15 0	2 4 0	1 5 9	1 14 6	1 12 3	1 13 0	1 12 6	2 6 0	2 12 3	2 14 3	1 13 6	1 13 9	2 0 9
<i>Payable by buyer.</i>													
Handling from weightment to godown.	0 9 0*	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0
Commission	0 2 6	0 2 6	0 2 6	0 3 3	0 3 0	0 10 0	0 10 0	0 3 9	0 5 0	0 5 0	0 6 0	0 5 0	0 4 10
Brokenage ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Charity ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Miscellaneous	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	0 11 6	0 11 6	0 11 6	0 12 3	0 12 0	1 3 0	1 3 0	0 12 9	0 14 0	0 14 0	0 15 0	0 14 0	0 13 10
Total market charges	2 10 6	2 15 6	2 1 3	2 10 9	2 8 3	3 0 0	2 15 6	3 2 9	3 10 3	3 12 3	2 12 6	2 11 9	2 14 7
Octroi, toll, vehicle taxes, etc.	..	..	..	..	..	0 3 0	0 3 0	..	..	..	..	..	0 0 6
GRAND TOTAL	2 10 6	2 15 6	2 1 3	2 10 9	2 8 3	3 3 0	3 2 6	3 2 9	3 10 3	3 12 3	2 12 6	2 11 9	2 15 1

*At 6 pice per bag on the average.

APPENDIX XXIV.

Merchandising charges on wheat in wholesale assembling markets in the Punjab.—Non-Colony markets.
(Per 100 rupees.)

Items.	Mandi Bahaudin.	Sialkot.	Gurdaspur.	Dinanagar.	Jullundur City.	Ludhiana.	Fazilka.	Abohar.	Dabhwal.	Budhisa.	Karnal.	Rohtak.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Payable by seller.</i>													
Handling—													
(a) up to weightment	0 14 6	0 10 6	0 14 3	0 9 6	0 6 6	0 9 3	0 6 0	0 4 6	0 6 3	0 8 0	0 2 0	0 2 0	0 7 9
(b) from weightment to go down.	..	..	..	..	..	..	..	..	..	..	..	..	..
<i>Karta, Dhalla & Dase</i>													
Commission	0 12 0	1 0 0	0 13 3	1 5 0	..	0 14 0	..	..	..	..	..	..	0 6 6
Brokerage	0 1 3	0 5 0	..	0 1 3	0 2 6	0 2 6	0 1 6	0 1 6	0 2 6	0 1 3	..	..	0 1 7
Charity	0 1 3	0 0 6	..	..	..	0 1 3	0 3 0	0 1 6	..	..	0 1 3	0 0 6	0 0 9
Miscellaneous	1 4 0	0 1 3	0 7 0	..	0 4 0	1 5 0	0 4 9	..	..	0 1 3	0 15 0	0 6 0	0 6 8
Total ..	3 1 0	2 1 3	2 2 6	1 15 9	0 13 0	3 0 0	0 15 3	0 7 6	0 8 9	0 10 6	1 2 3	0 8 6	1 7 3
<i>Payable by buyer.</i>													
Handling—													
(a) up to weightment	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 9 0	0 5 0	0 5 0	..	0 9 0	..	0 1 7
(b) from weightment to go down.	..	..	..	..	..	..	..	..	..	..	..	..	0 9 0
Commission	0 10 0	..	0 10 0	..	1 9 0	0 8 6	1 14 0	1 9 0	1 9 0	1 3 6	0 14 0	1 3 0	0 15 6
Brokerage	..	..	..	..	..	..	..	..	..	0 4 0	0 2 0	..	0 0 6
Charity	..	..	..	..	..	..	..	..	..	0 0 6	..	..	..
Miscellaneous	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	1 3 0	0 9 0	1 3 0	0 9 0	2 2 0	1 1 6	2 7 0	2 7 0	2 7 0	2 1 0	2 2 0	1 12 0	1 10 7
Total market charges	4 4 0	2 10 3	3 5 6	2 8 9	2 15 0	4 1 6	3 6 3	2 14 6	2 15 9	2 11 6	3 4 3	2 4 6	3 1 10
Octroi, toll, vehicle taxes, etc.	0 3 0	2 12 0	..	1 6 0	0 14 9	..	..	..	..	..	1 15 0	..	0 9 7
GRAND TOTAL	4 7 0	5 6 3	3 5 6	3 14 9	3 13 9	4 1 6	3 6 3	2 14 6	2 15 9	2 11 6	5 3 3	2 4 6	3 11 5

Note.—“Miscellaneous” includes charges for “shagirdis” or apprentice, “mehra” or water carrier, “chukra” or sweeper, “tabalas” or stable, municipal watertax, and kachcha bazar.

APPENDIX XXV.
Merchandising charges on wheat in wholesale assembling markets in the western United Provinces.
 (Per 100 rupees.)

Items.	Hapur.	Ghaziabad.	Meerut.	Muzaffarnagar.	Shamli.	Deoband.	Sikandra- bad.	Hathras.	Agra.	Chandani.	Average.
	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.
<i>Payable by seller.</i>											
Handling—											
(a) upto weightment	0 8 0	0 3 9	0 6 3	0 8 9	0 14 6	0 10 0	0 5 0	0 2 6	0 4 7	0 5 0	0 6 10
(b) from weightment to godown	0 2 6	0 2 6	0 10 0	..	..	..	0 2 6	0 13 6	..	..	0 3 1
Karwa, Dhalla and Dawa	..	..	0 3 9	..	0 7 6	0 2 6	..	0 10 0	..	..	0 2 5
Commission	0 7 6	..	..	0 10 6	0 6 0	0 12 6	..	..	..	0 7 6	0 4 5
Brokerage	..	0 2 6	0 3 9	..	0 1 0	..	..	0 5 0	0 3 0	..	0 1 6
Charity	0 1 0	0 1 0	0 0 6	0 0 6	0 1 6	0 2 6	0 1 0	0 2 0	..	..	0 1 0
Miscellaneous	0 2 6	0 2 6	0 7 8	0 5 0	0 2 6	0 2 6	0 2 6	0 8 6	..	0 7 6	0 4 1
Total	1 5 6	0 12 3	1 15 11	1 8 9	2 1 0	1 14 0	0 11 0	2 9 6	0 7 7	1 4 0	1 7 4
<i>Payable by buyer.</i>											
Handling—											
(a) upto weightment	..	0 2 6	0 2 6	0 1 0	..	..	..	..	..	..	0 0 7
(b) from weightment to godown	0 7 6	0 10 0	0 8 0	0 8 0	0 8 0	0 8 0	0 2 6	..	..	0 10 6	0 6 3
Commission	0 10 0	1 6 6	1 9 0	0 6 3	0 6 3	1 1 0	1 9 0	1 5 0	1 5 0	0 12 6	1 0 8
Brokerage	..	..	..	..	..	0 0 6	..	..	0 3 0	..	0 0 4
Charity	..	..	..	0 0 6	..	..	..	..	0 1 6	0 1 0	0 0 4
Miscellaneous	..	..	..	..	..	..	..	..	..	..	..
Total	1 1 6	2 3 0	2 3 6	0 15 9	0 14 3	1 9 6	1 11 6	1 5 0	1 9 6	1 8 0	1 8 2
Total market charges	2 7 0	2 15 3	4 3 5	2 8 6	2 15 3	3 7 6	2 6 6	3 14 6	2 1 1	2 12 0	2 15 6
Octroi, toll, vehicle taxes, etc.	..	0 10 0	*	0 2 6	..	..	0 15 0	0 13 9	2 3 0	0 8 9	0 8 6
GRAND TOTAL	2 7 0	3 9 3	4 3 5	2 11 0	2 15 3	3 7 6	3 5 6	4 12 3	4 4 1	3 4 9	3 8 0

* No municipal dues are payable on arrivals at Kaisergunj—it is a free market.

APPENDIX XXVI.

Merchandising charges on wheat in wholesale assembling markets in the central and eastern United Provinces, Central India, Rajputana and Sind.
(Per 100 rupees.)

Items.	Central United Provinces.					Eastern United Provinces.			Central India—		Rajputana—		Sind.		Average.			
	Cawn- pore.	Lucknow (Fateh- ganj).	Banda.	Bareilly.	Banars.	Fyzabad.	Indore.	Kotah.	Shikar- pur.	Sukkur.	Central and Eastern United Provinces.	Central India.	Rajpu- tana.	Sind.				
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.				
<i>Payable by seller.</i>																		
Handling—																		
(a) upto weight	0 2 6	0 10 6	*	0 7 0	0 2 6	0 7 9	0 7 6	0 6 8	0 15 9	1 13 9	0 5 0	0 7 6	0 6 8	1 6 9				
(b) from weight	0 15 0	0 10 0	0 5 0	0 4 0	..	0 2 0	..	..	..	..	0 6 0	..	..	..	
to godown ..																		
<i>Kards, Dhells and</i>																		
<i>Dose ..</i>	0 13 9	1 5 6	1 4 0	0 10 0	0 7 6	2 8 3	1 14 0	0 10 0	0 15 9	0 15 9	1 2 10	1 14 0	0 10 0	..				
Commission ..	..	0 7 6	1 12 0	1 0 0	0 12 6	1 0 0	1 0 0	0 12 0	0 15 9	0 15 9	0 13 4	1 0 0	0 12 0	0 15 9				
Brokerage ..	0 10 0	..	..	0 2 0	0 4 0	..	0 1 0	0 3 4	0 5 3	0 5 3	0 2 8	0 1 0	0 3 4	0 5 3				
Charity ..	0 4 9	0 1 0	0 1 0	0 1 9	0 1 6	0 2 9	0 0 6	0 1 8	0 5 3	0 5 3	0 2 1	0 0 6	0 1 8	0 5 3				
Miscellaneous ..	0 5 0	0 4 6	0 4 3	0 3 9	..	0 11 0	0 2 0	..	..	..	0 4 9	0 2 0	..	..		
Total ..	3 3 0	3 7 0	3 10 3	2 12 6	1 12 0	4 15 9	3 9 0	2 1 8	2 10 0	3 8 0	3 4 8	3 9 0	2 1 8	3 1 0				
<i>Payable by buyer.</i>																		
Handling—																		
(a) upto weight	0 4 0	..	..	0 7 6	0 3 9	..	..	0 3 4	..	..	0 2 6	..	0 3 4	..				
(b) from weight	..	..	..	1 0 0	..	0 2 0	0 6 0	0 3 4	0 10 6	0 10 6	0 3 0	0 6 0	0 3 4	0 10 6				
to godown ..																		
Commission ..	1 4 0	1 9 0	..	..	0 12 6	0 12 6	..	0 3 4	0 5 3	0 5 3	0 11 8	..	..	0 3 4				
Brokerage ..	0 4 0	..	..	..	0 4 0	..	..	..	..	..	0 1 4	..	..	0 7 0				
Charity ..	0 0 6	..	..	..	..	0 0 3	..	..	..	..	0 0 1	..	..	..	
Miscellaneous ..	0 0 6	..	..	..	..	..	..	..	..	..	0 0 1	..	..	..	
Total ..	1 13 0	1 9 0	..	1 7 6	1 4 3	0 14 9	0 6 0	0 10 0	0 15 9	1 3 3	1 2 8	0 6 0	0 10 0	1 1 6				
Total market charges..	5 0 0	5 0 0	3 10 3	4 4 0	3 0 3	5 14 6	3 15 0	2 11 8	3 9 9	4 11 3	4 7 4	3 15 0	2 11 8	4 2 6				
Oatrol, toll, vehicle	1 4 0	1 12 6	1 4 0	3 9 0	4 8 9	1 11 3	0 3 9	..	..	1 5 0	2 5 7	0 3 9	..	0 10 6				
taxes, etc. ..	6 4 0	6 12 6	4 14 3	7 13 0	7 9 0	7 9 9	4 2 9	2 11 8	3 9 9	6 0 3	6 12 11	4 2 9	2 11 8	4 13 0				
GRAND TOTAL ..																		

* Weight is done by the buyer himself and his remuneration for this purpose is included under commission.

APPENDIX XXVII.
Merchandising charges on wheat in wholesale assembling markets in the Central Provinces.
 (Per 100 rupees.)

Items.	Saugor.	Damoh.	Jubbulpore.	Khitola.	Katni.	Umrer.	Itarsi.	Gadawah.	Pipriya.	Kareli.	Drug.	Average.
	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.
<i>Payable by seller.</i>												
Handling—												
(a) upto weight	1 2 7	0 15 5	0 9 0	0 12 0	0 13 4	0 9 4	0 6 3	1 4 0	1 8 2	1 1 0	..	0 13 2
(b) from weight	..	..	..	0 3 4	..	1 7 3	..	..	0 3 0	..	..	0 2 8
godown.												
Karda, Dhaka and Dams	0 15 3	1 0 8	2 5 6*	1 4 0	1 5 0	..	2 8 0*	1 4 0*	1 4 0	1 4 0*	..	1 3 2
Commission ..	0 13 4	1 7 4	0 12 0	1 0 0	0 3 4	1 4 0	0 12 8	0 8 4	0 7 9	0 12 6	..	0 11 9
Brokerage ..	..	..	0 4 0	..	..	..	..	0 4 2	..	0 4 2	..	0 1 1
Charity ..	0 3 4	0 3 4	0 6 8	0 5 10	0 1 8	..	0 6 9	0 4 2	0 2 7	0 8 4	..	0 3 11
Miscellaneous ..	0 5 4	0 5 10	0 15 9	0 10 0	0 6 0	..	0 7 7	0 14 2	1 2 7	0 9 0	..	0 8 5
Total ..	3 7 10	4 0 7	5 4 11	4 3 2	2 13 4	3 4 7	4 9 3	4 6 10	4 12 1	4 7 0	..	3 12 2
<i>Payable by buyer.</i>												
Handling—												
(a) upto weight	..	..	..	..	..	0 6 8	..	..	0 1 0	..	0 3 4	0 0 11
(b) from weight	to	0 3 4	0 5 10	..	..	..	0 6 0	..	..	..	0 10 10	0 2 9
godown.												
Commission ..	..	..	..	..	..	..	..	..	..	..	..	..
Brokerage ..	..	..	..	..	..	..	..	0 4 2	..	..	0 4 2	0 0 9
Charity ..	..	..	..	..	..	..	..	..	..	..	..	..
Miscellaneous ..	0 1 1	0 1 1	0 1 1	0 1 1	0 1 1	0 1 1	0 1 1	0 1 1	0 1 1	0 0 10	0 2 9	0 1 3
Total ..	0 4 5	0 4 5	0 6 11	0 1 1	0 1 1	0 7 9	0 7 1	0 5 3	0 2 1	0 0 10	1 5 1	0 5 8
Total market charges	3 12 3	4 5 0	5 11 10	4 4 3	2 14 5	3 12 4	5 0 4	4 12 1	4 14 2	4 7 10	1 5 1	4 1 10
Ostroi, toll, vehicle taxes,	0 4 5	0 8 11	1 11 3	0 3 4	..	2 5 8	0 8 11	..	..	..	0 6 5	0 8 10
etc.												
GRAND TOTAL ..	4 0 8	4 13 11	7 7 1	4 7 7	2 14 5	6 2 0	5 9 3	4 12 1	4 14 2	4 7 10	1 11 6	4 10 8

* There is no fixed rate for Karda. The figure represents an estimate of excess weightments.

APPENDIX XXVIII.

Merchandising charges on wheat in wholesale assembling markets in Bihar and Orissa.

(Per 100 rupees.)

Items.	Khagaria.	Bettiah.	Purnea.	Nangoohia.	Bhagalpur.	Jamalpur.	Monghyr.	Lullusarai.	Hilsa.	Muzaffarpur.	Darbhanga.	Average for Bihar and Orissa.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Payable by seller.</i>												
Handling ..	0 2 0	0 9 9		0 1 0		0 1 3	..	0 1 0	0 3 3	..	0 3 3	0 1 11
Kardis, Dhais and Dais ..	1 4 0	1 0 0	1 4 0	0 11 0	1 0 0	..	..	0 10 0	0 10 0	0 4 0	0 10 0	0 10 8
Commission ..	0 14 0	0 12 0	1 0 0	0 12 0	..	0 12 0	1 4 0*	0 14 0	0 12 0	1 9 0	0 12 0	0 13 7
Brokerage ..	..	..	..	..	..	..	..	..	..	..	..	..
Charity ..	0 1 0	0 1 0	0 2 6	0 1 6	0 0 6	0 2 3	0 2 6	0 1 9	0 1 0	0 2 0	0 2 3	0 1 8
Miscellaneous ..	1 4 0	0 2 0	0 2 6	0 2 3	0 1 0	0 1 6	0 10 0	0 3 0	0 1 0	..	..	0 3 11
Total ..	3 9 0	2 8 9	2 9 0	1 11 9	1 1 6	1 1 0	2 0 6	1 13 9	1 11 3	1 15 0	1 11 6	1 15 9
<i>Payable by buyer.</i>												
Handling ..	..	0 9 9	1 8 0	0 2 0	..	..	..	0 1 0	0 3 3	0 1 9	0 8 3	0 4 7
Commission ..	0 14 0	0 12 0	1 8 0	0 12 0	1 9 0*	0 12 6	0 12 6*	0 14 0	0 12 0	1 9 0	0 12 0	0 15 11
Brokerage ..	..	..	..	..	..	0 6 6	0 2 6	..	..	..	..	..
Charity ..	0 1 3	0 1 0	0 2 6	0 1 6	0 2 6	0 6 6	0 2 6	0 1 6	0 1 0	0 3 6	0 2 3	0 2 4
Miscellaneous ..	0 3 8	0 6 3	..	0 1 0	0 2 0	..	..	0 2 9	0 1 0	0 2 3	0 2 9	0 2 0
Total ..	1 2 11	1 13 0	3 2 6	1 0 6	1 13 6	1 3 0	0 15 0	1 3 3	1 1 3	2 0 6	1 9 3	1 8 10
Total market charges ..	4 11 11	4 5 9	5 11 6	2 12 3	2 15 0	2 4 0	2 15 6	3 1 0	2 12 6	3 15 6	3 4 9	3 8 7
GRAND TOTAL ..	4 11 11	4 5 9	5 11 6	2 12 3	2 15 0	2 4 0	2 15 6	3 1 0	2 12 6	3 15 6	3 4 9	3 8 7

Note.—Paid by seller—"Miscellaneous" includes *Tabia*, *Bichaspriit*, *Jamadar* and *Chetki*.

Paid by Buyer—"Miscellaneous" includes *Tabia*, *Bichaspriit*, *Jamadar* and *Chetki*.

* Includes weightment also.

APPENDIX XXIX.
Merchandising charges on wheat in wholesale assembling markets in Bombay and Hyderabad State.
 (Per 100 rupees.)

Items.	Bombay.					Hyderabad State.					Average.	
	Bijapur.	Hubli.	Dharwar.	Belgaum.	Sholapur.	Jalna*.	Latur*.	Nanded*.	Secunderabad.	Bid.†	Parbhani.†	Bombay.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Payable by seller.</i>												
<i>Handling—</i>												
(a) upto weight	0 8 0	0 8 0	0 8 9	0 6 3	0 10 6	0 6 4	..	0 5 6	0 8 3	0 6 11	0 6 4	0 3 11
(b) from weight	..	..	..	..	..	..	..	..	..	..	..	0 7 2
to godown.	..	..	..	..	..	..	..	..	..	..	..	..
<i>Karwa, Dhalla and</i>												
<i>Dene.</i>	0 8 0	1 9 0	1 9 0	1 9 0	..	1 3 6	2 3 9	1 15 8	2 7 1	0 15 11	1 7 8	1 0 7
Commission	..	..	..	..	..	..	..	0 2 2	0 1 11	0 2 9	0 1 11	0 2 1
Brokerage	0 4 0	..	0 3 9	0 1 0	0 1 7	..	0 0 7	0 2 9	1 13 8	..	0 2 9	0 0 11
Charity ..	0 1 6	..	0 1 1	..	0 2 1	0 1 5	..	0 2 9	1 13 8	..	0 2 9	0 1 5
Miscellaneous	..	..	..	..	..	..	..	..	..	..	..	..
Total	1 5 6	2 1 0	2 6 7	2 0 3	0 14 2	1 11 3	2 4 4	2 10 1	4 14 11	1 9 7	2 2 8	1 11 11
<i>Payable by buyer.</i>												
<i>Handling—</i>												
(a) upto weight	0 9 4	1 2 9	0 9 4	0 3 2	0 2 0	..	..	..	..	..	..	0 2 11
(b) from weight	0 6 3	..	..	0 9 4	0 6 3	..	..	..	..	..	..	0 10 10
to godown.	..	..	..	..	..	..	..	..	..	..	..	..
Commission	1 9 0	0 12 0	1 0 0	1 9 1 0	2 2 0	..	..	..	..	..	..	0 15 0
Brokerage	0 8 0	..	0 1 10	..	..	..	..	..	..	..	..	0 9 0
Charity ..	..	..	0 9 4	..	..	..	..	..	..	..	..	0 0 4
Miscellaneous	..	..	..	..	..	..	..	..	..	..	..	0 1 10
Total	3 0 7	1 14 9	2 4 6	2 5 6	2 10 3	..	..	..	..	..	..	2 7 1
Total market charges	4 6 1	3 15 9	4 11 1	4 5 9	3 8 5	1 11 3	2 4 4	2 10 1	4 14 11	1 9 7	2 2 8	4 3 0
Oetroi, toll, vehicle taxes, etc.	1 15 3	..	..	1 13 2	1 2 9	0 8 3	0 8 3	0 8 3	0 2 9	0 5 6	0 5 6	0 15 10
GRAND TOTAL	6 5 4	3 15 9	4 11 1	6 2 11	4 11 2	2 3 6	2 12 7	3 2 4	5 1 8	1 15 1	2 8 2	5 2 10

* Regulated Market.

† Unregulated Market.

2 11 4 6

3 13 0

APPENDIX XXX.
Average merchandising charges on wheat in wholesale assembling markets.
 (Per 100 Rupees.)

Items.	Punjab.			United Provinces.		Central Provinces.	Bihar and Orissa.	Bombay.	Sind.	Hyderabad.	
	Canal Colony.	Non-Colony.		Western.	Central and Eastern.					Regulated.	Unregulated.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Payable by seller—</i>											
<i>Handling—</i>											
(a) upto weightment ..	0 11 8	0 7 9	0 6 10	0 3 1	0 5 0	0 13 2	0 1 11	0 8 4	1 6 9	0 3 11	0 7 2
(b) from weightment to godown ..	0 0 9	..	0 3 1	0 2 5	0 6 0	0 2 8	..	..	..	..	..
<i>Kardas, Dhadda and Dase</i>	..	..	..	..	1 2 10	1 3 2	0 10 8	..	..	..	..
Commission ..	0 15 2	0 6 4	0 4 5	0 13 4	0 13 4	0 11 9	0 13 7	1 0 7	0 15 9	1 13 0	1 10 3
Brokerage ..	0 1 2	0 1 7	0 1 6	0 2 8	0 1 1	0 1 1	..	..	0 5 3	..	..
Charity ..	0 1 0	0 0 9	0 1 0	0 2 1	0 2 1	0 3 11	0 1 8	0 2 1	0 5 3	0 0 11	0 2 2
Miscellaneous ..	0 3 0	0 6 8	0 4 1	0 4 9	0 4 9	0 8 5	0 3 11	0 0 11	..	0 1 5	0 10 10
Total (Seller) ..	2 0 9	1 7 2	1 7 4	3 4 8	3 4 8	3 12 2	1 15 9	1 11 11	3 1 0	2 3 3	2 14 5
<i>Payable by buyer—</i>											
<i>Handling—</i>											
(a) upto weightment ..	..	0 1 7	0 0 7	0 2 6	0 2 6	0 0 11	0 4 7	0 2 11	..	..	..
(b) from weightment to godown ..	0 9 0	0 9 0	0 6 3	0 3 0	0 3 0	0 2 9	..	0 10 0	0 10 6	..	..
Commission ..	0 4 10	0 15 6	1 0 8	0 11 8	0 11 8	..	0 15 11	0 15 0	..	..	..
Brokerage ..	..	0 0 6	0 0 4	0 1 4	0 1 4	0 0 9	0 2 4	0 9 0	0 7 0	..	..
Charity ..	..	0 0 1	0 0 4	0 0 1	0 0 1	..	0 2 4	0 0 4	..	..	..
Miscellaneous ..	..	..	..	0 0 1	0 0 1	0 1 3	0 2 0	0 1 10	..	..	..
Total (Buyer) ..	0 13 10	1 10 8	1 8 2	1 2 8	1 2 8	0 5 8	1 8 9	2 7 1	1 1 6	..	..
Total market charges ..	2 14 7	3 1 10	2 15 6	4 7 4	4 7 4	4 1 10	3 8 6*	4 3 0	4 2 6	2 3 3	2 14 5
Ootroi, toll, vehicle taxes, etc. ..	0 0 6	0 9 7	0 8 6	2 5 7	2 5 7	0 8 10	..	0 15 10	0 10 6	0 8 3	0 4 7
GRAND TOTAL ..	2 15 1	3 11 5	3 8 0	6 12 11	6 12 11	4 10 8	3 8 6*	5 2 10	4 13 0	2 11 6	3 3 0

*The figure refers to produce handled in bags and is exclusive of charges for cleaning and *karda*. To make it comparable with figures for other areas a sum of say Rs. 0.11-10 pased on the average charges on these items in the adjoining markets of the United Provinces should be added.

APPENDIX XXXII.

THE * * * BANK LIMITED.

Agreement to secure a Cash Credit on Goods Deposited.

No. _____

Amount Rs. _____

Name _____

The * * * Bank Limited (hereinafter called "the Bank") having at the request of Messrs. _____ (hereinafter called "the Borrowers") opened or agreed to open in the Books of the Bank at _____ a Cash Credit Account to the extent of Rs. _____ with the borrowers to remain in force for a period of _____ months from the _____ day of _____ 193 , and to be secured by goods to be pledged with the Bank.

IT IS HEREBY AGREED between the Bank and the Borrowers (the borrowers agreeing jointly and severally) as follows :—

1st.—That the goods and merchandise mentioned in the Schedule hereto which have been already deposited and the goods and merchandise which shall be hereinafter deposited with the Bank under this agreement (hereinafter called "the Securities") shall remain and be placed in the exclusive possession and under the exclusive control of the Bank and in such a manner that such possession and control shall be apparent and indisputable. Provided that the Bank shall not be responsible for the loss, destruction, or deterioration of the goods deposited by any means.

* * * * *

4th.—That all securities as aforesaid shall be insured against the fire risks by the Borrowers in some Insurance Office approved by the Bank to the full extent of the value of such Securities, that the fire-policies shall either be taken out in the name of the Bank or be assigned to the Bank. Should the Borrowers fail to insure, the Bank shall be at liberty to effect such insurance at the expense of the Borrowers.

5th.—That a margin of _____ per cent at least to be fixed by the Bank from time to time in favour of the Bank, shall be always maintained by the Borrowers between the sum (including interest and other customary charges) for the time being due to the Bank on the said Cash Credit Account and the open market value of the Securities either by the deposit of further Security to be approved by the Bank, or by Cash Payment by the Borrowers, immediately on the market value for the time being of the securities becoming less than the amount equal to the balance then due to the Bank as aforesaid and the margin to be fixed and that in default of provision of such margin the whole amount due to the Bank on the said Cash Credit Account shall be immediately paid by the Borrowers if the Bank so requires.

6th.—That the interest at the rate of _____ per cent per annum shall be calculated on the daily balance due to the Bank of the said Cash Credit account.

7th.—That on the expiration of the said period of _____ months from the _____ day of _____ 193 , the Borrowers shall pay to the Bank the balance within the limit hereinbefore mentioned, then outstanding and owing to the Bank on the said Cash Credit Account inclusive of interest at the rate above mentioned to the date of payment.

8th.—That if when called upon by the Bank to maintain such margin as aforesaid the Borrowers shall fail to do so, such balance of principal and interest monies as may be then due to the Bank, it shall be lawful for the Bank forthwith, or at any time thereafter and without any notice to the Borrowers to sell or otherwise dispose of all or any of the Securities and to apply the net proceeds of such sale towards the liquidation of principal and interest monies due to the Bank, together with all charges to be incurred by the Bank.

9th.—That if the net sum realised by such sale be insufficient to cover the amount so found due, the Borrowers promise and agree forthwith on production to them of the account so to be prepared and signed as aforesaid, to pay any further balance which may appear to be due by the Borrowers thereon.

10th.—Provided also that nothing herein contained shall be deemed to negative, qualify or otherwise prejudicially affect the right of the Bank to recover from all or any of the parties, including the Borrowers liable on all or any of the Bills of Exchange, Drafts, Cheques, Promissory Notes or Bonds which may at any time be held by the Bank as Security or part Security against the said Cash Credit Account.

11th.—And it is hereby agreed that in the event of there being a surplus available after payment of all such principal and interest monies and all charges and expenses of the net proceeds of such sale of Security as aforesaid, it shall be lawful for the Bank to apply the said surplus as far as the same shall extend in or towards payment or liquidation of any and all other monies which shall or may be due from the Borrowers or any one or more of them to the Bank by way of Loans.

* * * * *

14th.—That the Borrowers shall bear all expenses incurred by the Bank in this connection such as the pay of Godownkeepers and Chowkidars, and the travelling allowances of Inspectors, Managers, Godownkeepers and other officers and all such expenses shall be debited to the Borrowers' account in due course.

15th.—That the Bank will always be at liberty to stop making advances at any time without previous notice and without assigning any reason even though the said limit of Rs. _____ has not been fully availed of.

In witness hereof the Borrowers have hereunto set their hands this _____ day of _____ 193 , in the Christian year one Thousand Nine Hundred and

Schedule of Securities referred to in the foregoing Agreement.

APPENDIX XXXIII.
Certain physical and chemical characteristics of the wheats grown in India.

Province or State.	Bushel Weight.		Weight of 1,000 Kernels.		Moisture Content.		Protein.		Dry Gluten.		Notes.
	Average.	Maximum.	Average.	Maximum.	Average.	Maximum.	Average.	Maximum.	Average.	Maximum.	
	lb.	lb.	Grammes.	Grammes.	%	%	%	%	%	%	
Punjab—											
Canal Colonies ..	61.49	69.00	32.30	43.00	9.83	13.19	8.78	11.12	7.76	12.13	
East and South East ..	61.37	64.70	31.62	40.93	9.99	12.84	8.64	11.17	7.19	9.31	
West and South West ..	61.47	65.50	34.01	42.37	9.05	10.73	8.61	9.80	8.56	9.81	
North ..	62.15	64.80	32.72	38.68	9.89	11.78	8.17	10.94	8.30	10.12	
United Provinces—											
West ..	61.28	65.70	32.20	45.15	10.22	12.57	8.71	10.15†	7.31	11.85	* The protein content of a sample of Cawnpore 13 was 12.31.
Central ..	62.70	66.20	32.77	44.40†	10.72	12.67	9.69	10.37	8.45	10.23	† One sample of Cawnpore 13 weighed 50.06 grammes while another * durum sample 50.20 grammes.
East ..	62.70	64.80	32.46	41.02	11.23	..	13.57†	..	7.02†	..	‡ Only one instance.
Central Provinces—											
Vulgaris ..	61.21	66.25	36.82	45.60	10.44	11.66	9.24	11.12	8.30	10.35	§ Two durum samples weighed 46.55 and 48.25 grammes.
Durum ..	61.87	66.60	41.69	55.10	10.46	11.70	10.11	12.26	9.20	11.14	Only three samples analysed
Bombay—											
Vulgaris ..	62.58	64.50	37.74	44.68	10.90	12.35	10.17	13.06	11.35	14.73	
Durum ..	61.78	64.20	40.18	48.45	10.96	12.44	11.98	13.51	12.45	16.01	
Sind ..	60.80	65.50	31.68	39.92‡	9.67	10.53	9.97	12.60	9.59	13.55	
Bihar and Orissa ..	62.40	64.50	30.57	38.59	9.78	11.40	9.42	12.77	8.45	13.25	
North-West Frontier Province											
Bengal ..	60.60	61.70	33.47	48.03	9.64	9.86	9.40	10.20	8.11	9.60	
..	61.41	65.70	30.58	38.55	9.26	11.35	10.79	13.51	9.47	11.49	
Madras ..	60.60	63.33	35.69	45.58	..	..	..	..	..	..
Indian States—											
Rajputana ..	62.16	65.70	39.20	46.60||	8.90	9.22	10.48	14.65	9.26	11.88	|| Five durum samples weighed 58.25, 57.05, 53.75, 53.20 and 51.60 grammes.
Central India—											
Vulgaris ..	63.18	65.30	38.45	46.20	8.86	9.55	9.63	9.83	8.45	10.32	
Durum ..	63.08	66.00	44.91	57.80	9.45	9.75	11.15	12.77	9.87	12.40	
Hyderabad ..	60.34	65.30	39.17	47.22	10.81	11.63	13.97	13.97	10.73	16.90	
Kashmir ..	60.78	63.90	33.85	41.78	10.84	11.88	8.63	9.58	6.98	8.84	

APPENDIX XXXIV.

WHEAT CONTRACT.

Delivery Terms.

No. _____ Bombay, _____ 193 .

Broker _____ & Co.

Messrs. _____

Bombay.

Dear Sirs,

We have this day bought from you _____

_____ $\frac{\text{tons}}{\text{bags}}$ only 1 per cent more or less of wheat

Karachi/Bangla	70	per cent	white	30	per cent	red	
Pissi	%	soft	white and	%	soft	red	Crop,

Allowance will be charged for *katha* over 5%,

Fair average quality of the season,

at Rs. _____ and one *dokda dharmada* per cwt. net weight free Railway Station, Bombay or delivered at buyer's godown.

Bagging .. Goods shall be delivered in new Calcutta No. 2 Twills or heavy C Bags wg. not less than 2-1/8 lb. In the case of Godown delivery, bagging shall be same as in the case of Railway Delivery Terms.

Delivery .. _____ Sellers Option. Buyers shall not be obliged to accept tenders of less than 100 Bags at a time.

Buyers shall have the option to refuse Railway Receipts if not tendered 9 days before the due date of the contract.

In the event of this contract being for more than 50 tons each 50 tons to be regarded as a Separate Contract.

Refraction .. Dirt _____ % and Barley _____ % —reciprocal.

For Bombay qualities Dirt 4 per cent.

Cawnpore and Delhi Dirt 3 per cent and Barley and Gram 3 per cent.

Karachi Bangla Dirt 1½ per cent and Barley 2 per cent.

Payment .. Buyers shall pay 90 per cent against Railway Receipts or against delivery receipt from buyer's godown. But if sea-borne goods, buyers shall have the option to pay 90 per cent against receipts or goods.

Brokerage .. ½ per cent to be paid by sellers.

For other conditions see back.

Yours faithfully,

APPENDIX XXXIV—*contd.*

CONDITIONS.

1. All disputes, regarding Surveys on weight, refraction quality and bagging arising out of this contract, shall be submitted to arbitration in accordance with the rules of arbitration, agreed upon between the Grain Merchants Association and the European Exporters on the 1st November 1912.

2. If sellers have received an advance of 90 per cent weight shall be fixed upon the average weight of the sample bags, consisting of 10 per cent of the number of bags of each tender, which shall be weighed in the presence of sellers.

2(a). If sellers have not received an advance of 90 per cent buyers shall be obliged to keep the whole tender intact and sellers shall have the option to have the whole lot weighed in their presence. In the case of godown delivery, however, sellers shall give written intimation at the time of delivering the goods whether they wish to draw an advance of 90 per cent or not.

3. The sample for refraction and quality shall be drawn out of 10 bags only. If advance has been received by sellers, these 10 bags shall be taken out of the sample bags, consisting of 10 per cent of the number of bags of each tender. If advance of 90 per cent has not been received by sellers and provided that in case of godown delivery notice has been given by sellers as per clause 2a these 10 bags shall be taken out of the whole tender.

4. Cleaning Charges of Rs. 3-8-0 per 100 bags shall be paid by sellers if percentage of refraction exceeds 4 per cent the percentage of dirt stipulated in the contract.

5. In the case of godown delivery, buyers shall pay cartage at the rate of ten annas per ton if the goods have been delivered at any godown within B ward limits of the Bombay Municipality or fifteen annas per ton, if goods have been delivered at any godown outside the B ward limits of the Bombay Municipality except Sewri.

6. Buyers shall pay the balance due to sellers only on the latter producing the receipt or receipts for the contribution to the delivery Charity Fund.

7. *Refraction.*—Dirt, Oilseeds and other admixture including food stuffs except gram shall go as dirt.

7a. Barley up to 5 per cent only (in Cawnpore, Hathras, Karachi Bangla wheat) over and above that stipulated in the body of the contract shall be worth $\frac{1}{4}$ the contract price.

7b. Shrivelled grains in excess of 1 per cent shall be taken at $\frac{1}{4}$ th into dirt.

7c. Weevilled grains will be taken @ $\frac{1}{4}$ in dirt but in the old crop wheat delivered from 1st August upto end of season, weevilled upto 1 per cent will pass free.

8. *Quality.*—(a) Damaged grains shall be worth half the contract price (b) slightly damaged grains shall be worth $\frac{3}{4}$ th of the contract price.

9. Buyers shall have the option to reject a tender on which a quality allowance of 4 per cent or over has been awarded, or if the goods have been water damaged.

For Pissi wheat from stations on B. N. Railway, meter gauge line, if contracted for and if the quality turns out below 60/40, half an anna extra quality allowance over and above the usual allowance will be charged. Also the buyers shall have the option to reject, if the quality turns out below 40/60.

APPENDIX XXXV.

KARACHI PASS.

To expire on _____ CONTRACT No. _____

Agreement for sale and purchase of goods

_____ 193 .

It is agreed between _____

of _____ hereinafter referred to as sellers, who are fully guaranteed by Artyas and Guarantee brokers, and Messrs. AB & CO., Karachi, hereinafter referred to as buyers as follows :—

1. Sellers shall sell and buyers shall purchase _____ bags _____ mds. of _____ seers _____ of the crop _____ 193 Produce of _____ District _____ average quality of the season at the time of delivery at Rs. _____ per maund of _____ seers Railway Freight to be calculated at Rs. _____ per maund and any difference to be mutually recovered.

2. Discount to buyers _____.

3. Delivery to be completed in _____ and clean Railway Receipt to be delivered by sellers to buyer's Artyas at _____ on or before 3 P.M. of _____ the expiry day.

4. The goods to be delivered in dry, sound, and merchantable condition.

5. The goods to be packed, in brand new B twill gunnies of 2½ lbs. each size 44" × 26½", by sellers. Buyers to pay sellers the value of such gunnies at Rs. _____ say rupees _____ per 100 gunnies plus Rs. _____ As. _____ pies _____ gunny transportation charges per 100 bags as hereby agreed to between the parties.

(a) Bags to be properly sewn with the sellers' own twine.

(b) If on arrival of the goods in buyer's godown up country or at Keamari it is found that the bags supplied by the sellers are in bad condition or in any way inferior to those specified above, the buyers have the right to charge such allowance on same, which shall be final and binding as they may in their opinion consider necessary.

6. Each bag to contain _____ net _____ mds. _____ seers _____ chataks per maund of _____ seers which weight only will be accepted.

The goods to be free from damaged and touched grains.

7. Basis of admixture :—

%		%
%	Foreign matter _____	%
	including dirt, sand, dead seeds, etc.	

Should the goods tendered contain over the above percentages the buyers will have the following options :—

(a) of accepting the parcel with allowances, as per buyer's scale of allowances for excess refractions in force from time to time and which is known to the seller :

(b) of accepting the parcel and recleaning the goods at sellers' expense :

(c) of accepting the goods with an extra allowance, to be fixed by buyers on arrival of the goods at Keamari over and above the allowances as per scale :

(d) of rejecting the parcel and claiming and recovering from the sellers any loss they may sustain. If the stuff contains less than the above percentages, no allowance will be given to sellers unless otherwise stated in the buyer's scale of allowance.

8. In the event of the failure to deliver, or of short delivery, or of the rejection of any goods in exercise of any right or option arising under or conferred by this contract, buyers shall have the following option :—

(a) To simply cancel the contract.

(b) To claim and recover from the sellers the difference, if any, between the value at the contract price of the quantity of goods which shall not have been delivered or shall have been rejected, and the value of the like quantity of similar goods at the market rate at any station up-country or Karachi or in the home market on day next following the last day for delivery.

(c) To buy at ——— or Karachi the quantity of goods which shall not have been delivered or shall have been rejected, within the four business days next succeeding the last day for delivery, and to recover from sellers the difference, if any, between the value at the contract price of the quantity of goods so purchased and the value of the same quantity at the rate of purchase.

(d) If there shall be no goods available in the local market, the buyers to have the option of buying at Karachi, or at any other places up-country or in the home market and recover from sellers the difference between the contract rate and the rate of purchase, due allowance being made for any difference in freight or terms of purchase between the said two rates.

9. If sellers shall commit a breach of any one or more of the provisions of this contract on their part to be performed and a claim shall arise or be made by buyers for damage resulting for such breach, buyers shall be entitled to retain all moneys to the extent of their claim which at the date of such breach or subsequently there-to may be or become payable by buyers to sellers under this or any other contract or transaction and on their claim to damage for such breach being ascertained by agreement, award, a Judicial decision, buyers shall be entitled to appropriate the moneys which shall have been so retained by them against the damage payable to them under any agreement, award or decree that may be made, published or passed.

10. The goods shall be despatched at sellers expense and risk by rail from any station in consignments of not less than one wagonload, the Railway Receipt to be made, out in the name of ——— both as consignors and consignees.

11. Buyers to have option of weighing the whole parcel or of taking at average weight as customary.

12. In taking weights bags of more than one seer in excess of the stipulated weight of ——— lbs. net, not to be accepted in the average.

13. *Terms of Payment.*

(a) Buyers to advance sellers ——— % of the contract price of the goods, through their Artyas, at ——— in exchange for Railway Receipts.

(b) Buyers, through their Artyas, to pay the balance of the contract price after analysing the goods and taking delivery as provided for in clause 14 of this contract.

14. Contract price is understood for absolutely dry stuff and sellers shall without question or dispute accept as final and conclusive the first report of the buyers made after arrival and examination of the goods at Karachi or Keamari as to quality, quantity, weight, refraction and allowance for dryage, etc., if any to be made to buyers in respect thereof. Sellers to have the option to attend by their Agents or in person at Karachi or Keamari at the process of ascertaining refraction and weight, provided they are present at Karachi or Keamari without special notice while unloading and analysing.

15. Should any portion of goods to be delivered under this contract arrive at Karachi, or Keamari, in any respect unfit for shipment, buyers shall have the option of rejecting the goods which shall so arrive or of taking the same with an allowance the amount whereof shall be deremined by———Karachi.

16. In the event of non-delivery or short delivery or of the rejection of any goods in exercise of any right or option arising under or conferred by this contract, seller shall forthwith on demand refund to buyers the amount which shall have been advanced by buyers pursuant to clause 13 hereof on account of the contract price of such goods.

17. In the event of the rejection of any goods by buyers in exercise of any right or option arising under or conferred by this contract buyers shall notwithstanding such rejection and without prejudice thereto and their rights thereon be entitled to retain the goods so rejected until the refund by sellers of the amount advanced by buyers pursuant to clause 13 hereof on account of the contract price of such goods. Buyers shall give sellers notice of such retention and if within 10 (ten) days from the delivery of such notice at the last known place of the business or abode of sellers or either of them, sellers shall not refund the amount advanced by buyers on account of the contract price of the goods, buyers shall be entitled without the further notice to sellers, to sell the goods so retained, and to receive the sale proceeds thereof and apply the same to the repayment of the amount of their advance.

18. In the event of buyers becoming entitled by virtue of this contract or by the exercise of any option hereby given to any allowance or allowances in respect of any goods the amount whereof shall exceed the balance of the contract price of such goods which shall have been retained pending the receipt of the report of the said buyers, referred to in clause 14 hereof, sellers shall forthwith on demand pay to buyers the amount of such excess.

19. In case of any dispute whatsoever arising under this contract, the same is to be referred to two Europeans of Karachi, both of whom must belong to Mercantile Firms which are members of the Karachi Chamber of Commerce, one to be nominated by each party. If any party fails to nominate an arbitrator within 7 (seven) days from the date of request from the other, the other party has the right to nominate both. In case the arbitrators do not agree, they will appoint an umpire. If the arbitrators do not agree as to the choice of the umpire within 3 (three) days the Chairman of the Karachi Chamber of Commerce, or the gentleman acting for the time being as such, will be empowered to nominate one for them. The decision of the appointed arbitrators or the umpire shall be final and binding upon the parties.

20. The acceptance at any time by the purchasers of a quantity less than that contracted for, shall not under any circumstances be taken to cancel the contract as to the balance to be delivered.

21. Under no circumstances can the seller claim impossibility of performance or *force majeure*, for not fulfilling this contract.

22. The persons signing on behalf of the seller and buyers declare that they have a right to make the above contract on behalf of the said firms, and to also agree to clause No. 19 on behalf of all the persons composing the firms they represent.

23. The contents of this contract have been read over to us and duly understood by us and a copy given to us by———, Artys.

SELLERS.

BUYERS.

ARTYAS.

AND GUARANTEE BROKERS.

P. P.———

KARACHI.

APPENDIX XXXVI.

Bases of refraction for "futures" transactions in use by sixteen associations for wheat contracts.

Associations.	Dirt Content.			Barley and/or gram.			Damaged wheat content.			Content of Shrivelled grains.		
	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.
The Amritsar Produce Exchange, Ltd., Amritsar. The Lyallpur Shyam Sunder Trading Co., Ltd., Lyallpur. The Patiala Trading Co., Ltd., Jalandhar.	14% mutual.	..	3%	5%* mutual.	Upto 8% @ half value. Upto 24% @ half value. Upto 4% @ half value.	8%	Unspecified.	..	..	N/A.	..	..
	1% mutual.	Upto 2% @ full value.	2%	2% mutual.	Upto 24% @ half value.	24%	Do.	..	..	1% non-mutual.	..	..
	14% mutual.	Upto 34% @ full value.	34%	2% mutual.	Upto 4% @ half value.	4%	N/A.	(a) Upto 1% @ half value. (b) Over 1% upto 14% @ full value.	14%	2% non-mutual.	Over 2% upto 6% @ half value.	6%
	14% mutual.	Upto 3% @ full value.	3%	2% mutual.	Upto 4% @ half value.	4%	1% non-mutual.	Upto 2% @ half value.	2%	2% non-mutual.	Upto 6% @ quarter value.	6%
The Bharat Krishna Trading Co., Ltd., Okara. The Gojra Union Trading Co., Ltd., Gojra. The Swadesh Trading Co., Ltd., Saragodha.	14% mutual.	Upto 2% @ full value.	2%	2% mutual.	Upto 4% @ half value.	4%	1% non-mutual.	Upto 2% @ half value.	2%	..	..	..
	14% mutual.	Upto 2% @ full value.	2%	2% mutual.	Upto 4% @ half value.	4%	1% non-mutual.	Upto 2% @ half value.	2%	2% non-mutual.	Upto 8% @ quarter value.	3%
	14% non-mutual.	Upto 2% @ full value.	2%	6% non-mutual.	..	..	..	..	..	..	..	..
	14% mutual.	14% @ full value.	..	4% mutual.	Upto 5% @ half value.	5%	..	..	..	..	..	..
The Grain & Cotton Merchants Ltd., Lahore. The Beopar Bhandar, Ltd., Bernala (Patiala State). The Ganesh Beopar Bhandar Co., Ltd., Dhuri (Patiala State). The Chamber of Commerce, Hapur The Chamber of Commerce, Chandewsi.	14% mutual.	Upto 2% @ full value.	3%	4% mutual.	Upto 5% @ half value.	5%	1% non-mutual.	Upto 3% @ half value.	3%	2% non-mutual.	Upto 8% @ quarter value.	8%
	14% non-mutual.	Upto 3% @ full value.	3%	4% mutual.	Upto 5% @ half value.	5%	..	..	..	..	..	..
	14% non-mutual.	Upto 2% @ full value.	2%	2% non-mutual.	Upto 3% @ half value.	3%	..	..	..	..	..	..
	14% non-mutual.	Upto 2% @ full value.	2%	2% non-mutual.	Upto 3% @ half value.	3%	..	..	..	..	..	..

* This basis was enforced in May 1936 largely as a result of the conference between the Grain Trade Associations and the Central Marketing Staff held in April 1936. Before this there was no provision for dirt, and barley was 6% non-mutual.

APPENDIX XXXVI—contd.

Bases of refraction for "futures" transactions in use by sixteen associations for wheat contracts—contd.

Associations.	Dirt Content.		Barley and/or gram.		Damaged wheat content.		Content of Shrivelled grains.		
	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over.
The Grain Chamber, Ltd., Muzaffarnagar. The Bareilly Beopar Mandal, Ltd., Bareilly. Indian Merchants Association, Karachi.	2% non-mutual. Nil.	Upto 3% @ full value. At full value. Full value.	3%	4% non-mutual. 1% mutual. 5% mutual.	Upto 6% @ half value. Upto 2% @ half value. Half value.	6% .. ..	.. .. ..	Accepted as good wheat. 2% non-mutual. (a) upto 4% @ quarter value. (b) Over 4% upto 6% @ an extra allowance.	.. .. .. .. .. ..
	3% mutual	Full value.	..	..	..	..	1% non-mutual.	1% non-mutual.	1% non-mutual.

The Marwari Chamber of Commerce Ltd., Bombay.	*(i) 3% mutual. †(ii) 1½% mutual.	Over 3% @ full value. Over 1½% @ full value.	.. ..	3% mutual. 2% mutual.	Over 3% @ half value. Upto 5% @ half value. Over 5% @ full value.	.. .. ..	Nil. Nil.	@ quarter value to half value. Do.	.. .. .. ..
	2½% non-mutual.	Upto 2½% @ full value.	..	Nil.	Any excess @ half value.	..	1% non-mutual.	Nil.	@ half value.
The Calcutta Wheat and Seeds Association, Calcutta.	..	..	..	..	..	..	..	..	..

● Applies to Delhi-Cawnpore quality.

† Applies to Karachi-Bangla wheat (Sind and the Punjab).

APPENDIX XXXVI—contd.
Bases of refraction for "futures" transactions in use by sixteen associations for wheat contracts—contd.

Associations.	Red wheat content in contracts for white wheat.		Content of weevil grain.		Option to reject if over
	Free tolerance.	Deductions (if in excess of the tolerance).	Free tolerance.	Deductions. If in excess of the tolerance.	
The Amritsar Produce Exchange, Ltd., Amritsar. The Lyallpur Sham Sunder Trading Co., Ltd., Lyallpur.	30% non-mutual.	Over 30% upto 49% @ 1 pie % per maund.	Nil.	Weevil wheat is removed as far as possible by means of a broom while being sieved. (a) During Har upto 1 1/4% @ full value (b) During Sazan upto 1% @ quarter value.	Unspecified.
	25% non-mutual.	Do.	Nil.	During Bhadon upto 2% @ quarter value. During Asoj upto 3% @ quarter value. During Katik upto 4% @ quarter value. From Maghar-Magh upto 5% @ quarter value. From Phagun-Baisakh upto 6% @ quarter value.	
The Parbati Trading Co., Ltd., Jaranwala ... The Bharat Krishna Trading Co., Ltd., Okara.	25% non-mutual.	Over 30% upto 40% @ 3 pies per 5%.	Nil. Jeth-Sawan Bhadon-Katik	Upto 1% @ full value Over 1% upto 2% @ half value Over 2% upto 3% @ full value	Do.
	30% non-mutual.	Do.	1% 1% 1% 1% 2%	Over 1% upto 4% @ quarter value. Over 1% upto 4% @ quarter value. Over 2% upto 4% @ quarter value. Over 2% upto 4% @ quarter value.	
The Gojra Union Trading Co., Ltd., Gojra... The Svedesh Trading Co., Ltd., Sargodha. The Grain & Cotton Merchants Co., Ludhiana.	25% non-mutual.	Do.	1%	Over 1% upto 3% at quarter value	Unspecified.
	30% non-mutual.	Over 30% upto 40% @ 3 pies per 5%.	1% 4% 2% 2 1/4% 3%	Over 1% upto 3% at quarter value Over 1% upto 2% @ half value Over 2% upto 3% @ half value Over 2 1/4% upto 3 1/4% @ half value Over 3% upto 3 1/4% @ half value	

APPENDIX XXXVI—concl'd.
Bases of refraction for "futures" transactions in use by sixteen associations for wheat contracts—concl'd.

Associations.	Red wheat content in contracts for white wheat.		Content of weevilled grain.			
	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over	Free tolerance.	Deductions (if in excess of the tolerance).	Option to reject if over
The Beopar Bhandar, Ltd., Batala (Patiala State).	30% non-mutual.	..	..	Asoj Moghar Mogha Jeth-Har Sawan-Bhadon	Over 1% upto 3% @ half value Over 1% upto 4% @ half value Over 1% upto 4% @ half value Upto 1% @ full value Over 2% upto 5% @ half value	3% 4% 5% ..
The Ganesi Beopar Bhandar Co., Ltd., Dhari.	20% non-mutual.	..	20%	..	..	..
The Chamber of Commerce, Hapur.	25% non-mutual.	Over 25% @ $\frac{1}{2}$ pie per maund.	..	..	....	..
The Chamber of Commerce, Chaudausi	30% non-mutual.	..	..	..	....	..
The Grain Chamber, Ltd., Muzaffarnagar	14% non-mutual.	Over 14% upto 18% @ $\frac{1}{2}$ pie per maund. Over 18% @ half value.	..	1%	Over 1% @ full value	..
The Bareilly Beopar Mandals, Ltd., Bareilly	Unspecified.	..	..	1%	Excess @ $\frac{1}{2}$ — $\frac{1}{4}$ value	..
Indian Merchants Association, Karachi	30% non-mutual.	(a) Over 30% upto 40% @ 3 pies per 1 cwt. or part. (b) Over 40% upto 50% @ an extra quality allowance. Over 30% @ 1 anna per 10% per cwt.	50%	To be fixed monthly by the Board.	..	..
The Marwadi Chamber of Commerce, Ltd., Bombay	(i) 30 % non-mutual. (ii) 30 % non-mutual.	Do.	..	August-March	Over 1% @ quarter value	..
The Calcutta Wheat and Seeds Association, Calcutta.	..	..	..	Do.	Over 1% @ quarter value	..
	..	..	..	June June-May	Over 1% @ half value Over 3% @ half value	....

During August 1935 the terms were:— $\frac{1}{4}$ per cent free. Over $\frac{1}{4}$ per cent upto 1 per cent at quarter value. Over 1 per cent to be rejected.

APPENDIX XXXVII.

Description of wheat tenderable and months of delivery at sixteen associations.

Description of wheat tenderable.		Months of delivery.	
Associations.	Description.	Months of delivery.	Corresponding English months.
The Amritsar Produce Exchange, Ltd., Amritsar.	White wheat—current year's crop.	Har, Asoj, Maghar, Magh, Chait and Baisakh.	June-July, September-October, November-December, January-February, March-April, and April-May.
The Lyallpur Sham Sunder Trading Co., Ltd., Lyallpur.	White wheat—Indian produce.	Har, Asoj, Maghar, Magh and Phagun.	June-July, September-October, November-December, January-February, and February-March.
The Partab Trading Co., Ltd., Jaranwala.	White wheat—Punjab produce.	Jethi Har, Asoj, Maghar, Magh, Phagun and Chait.	May-June/June-July, September-October, November-December, January-February, February-March and March-April.
The Bharat Krishna Trading Co., Ltd., Okara.	White wheat of the current year (pit wheat not tenderable).	Har, Asoj, Maghar, Magh, Phagun and Chait.	June-July, September-October, November-December, January-February, February-March and March-April.
The Gojra Union Trading Co., Ltd., Gojra.	White wheat	Do. do. do. ..	Do. do. do.
The Swadesh Trading Co., Ltd., Sar godha.	Good quality—current year's crop.	Do. do. do. ..	Do. do. do.
The Grain and Cotton Merchants Co., Ludhiana.	White wheat	Har, Asoj, Maghar, Magh, Chait and Baisakh.	June-July, September-October, November-December, January-February, March-April and April-May.
The Beopar Bhandar, Ltd., Barnala (Patiala State).	Not available	Not available	Not available.

APPENDIX XXXVII—*contd.**Description of wheat tenderable and months of delivery at sixteen associations—contd.*

Description of wheat tenderable.		Months of delivery.	
Associations.	Description.	Months of delivery.	Corresponding English months.
The Ganesh Beopar Bhandar Co., Ltd., Dhuri.	Not available	..	Not available.
The Chamber of Commerce, Hapur	White wheat	..	May-June, August-September, November-December and January-February.
The Chamber of Commerce, Chandausi	White wheat	..	May-June, August-September, November-December and January-February.
The Grain Chamber, Ltd., Muzaffarnagar.	White wheat—current year's crop.	<i>Jeth, Bhadon, Asoj, Maghar and Phagun.</i>	May-June, August-September, September-October, November-December and February-March.
The Bareilly Beopar Mandal, Ltd., Bareilly.	Unspecified	<i>Jeth, Bhadon, Maghar and Magh.</i>	May-June, August-September, November-December and January-February.
Indian Merchants Association, Karachi.	White wheat—Sind and Punjab produce.	May, July, September, October, November, December, January and March.	....
The Marwadi Chamber of Commerce, Bombay.	(i) Delhi-Cawnpore .. (ii) Karachi-Bangla (Sind and Punjab).	May, September and January	....
The Calcutta Wheat and Seeds Association, Calcutta.	Cawnpore and Punjab	May and September ..	....

APPENDIX XXXVIII.

A typical form of contract for "futures" trading is adopted by the Sham Sunder Trading Coy., Ltd., at Lyallpur, the more important features of which provide for the observance of the following conditions :—

- (a) All contracts to be in writing and delivery at Lyallpur.
 - (b) Deposits to be paid to the Company within 48 hours of completion of the transaction. The rates are specified for each article.
 - (c) After payment of the schedule margin money it is the duty of the buyer and seller to ensure that the Company is always in possession of sufficient margin of deposits to cover possible losses. In the event of the traders failing to deposit extra margin money the Company is entitled to sell or settle contracts at the buyer's responsibility.
 - (d) The sellers are obliged to issue delivery orders for all transactions from the first to the fifteenth day of the delivery month.
 - (e) The buyers are responsible to have their purchases weighed over within five days from receipt of delivery order from the Company and weighments are to commence two hours after the goods have been approved. From the sixteenth to the twentieth day of the delivery month the buyer may issue the letter of demand to the Company for the balance of transactions as struck on the fifteenth day.
 - (f) The quantity of each commodity offered for delivery is not to exceed two hundred bags daily. No deliveries shall be effected on rainy or very cloudy days. Such days are not to be considered as working days.
 - (g) Twenty-four hours after delivery of the goods, the full price thereof is to be paid plus the recognised market charges. Payments to be made at Lyallpur.
 - (h) The production of any country other than India shall not be tenderable.
 - (i) Scale of allowances :—
 - 1 % free tolerance for dirt and extraneous matter ;
 - 2 % for barley, and gram ;
 - 1 % for shrivelled ;
 - 1 % for slightly damaged ; and
 - 25 % for red wheat.
- A suitable sliding scale for weevilled grain according to the time of the year is also laid down.
- (j) The goods are to be hand-cleaned for weighment. During *har* the goods shall be weighed by means of beam scale and during the rest of the year by hand scale.
 - (k) The packing shall be 2 maunds 28 seers per bag. The tare of the empty bag shall be taken as 3 lb.
 - (l) The results of analysis as conducted in the office of the Company shall be final.
 - (m) Disputes regarding delivery shall be decided by two arbitrators, one to be appointed by the aggrieved party and the other by the Company. Arbitrators shall be appointed from the Directors of the Company.

- (n) Disputes regarding transactions or payments shall be decided by two arbitrators selected from the shareholders of the Company, one chosen by the aggrieved party and one by the Company. Arbitration fees to be paid by the losing party.
- (o) Adjustments of profit and loss to or from the buyer or seller shall be made after transactions have been finally adjusted.
- (p) Interest to be paid at 6 per cent. per annum on the margin money during the whole period and on the amount of profit or loss for the period between the contract date and the date of settlement of the transaction.
- (q) The minimum unit of transaction is 100 bags if the transaction involves a large quantity the minimum quantity offered for delivery at any one time shall not be less than one unit of transaction.
- (r) List of charges payable to the Company on all sales and purchases are as follows :—

Arhat—

				Rs. A. P.			
From members of the Indian Merchants' Association, Lyallpur				0	4	0	per cent.
From non-members				0	8	0	" "
Brokerage				0	0	6	" "
Dharmao (Charity)				0	0	3	" "
Gnushala				0	0	3	" "

APPENDIX XXXIX.

Cost of storing 250 Mds. (100 bags) of wheat per season in kotlis at some important markets in the Punjab, the United Provinces, Sind and Bihar.

Items.	Punjab.						United Provinces.			Sind.	Bihar & Orissa.
	Amritsar.	Moga.	Jullundur.	Sargodha.	Fazilka.	Macrod-ganj Road.	Muzaffarnagar.	Shamli.	Chandausi.	Sokkur.	Patna.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1. Rent ..	7 8 0	12 0 0	0 0 0	9 6 0	6 0 0	7 8 0	4 0 0	8 0 0	5 0 0	7 8 0	6 4 0
2. Lining ..	0 10 0	0 4 0	0 6 0	0 4 0	0 10 0	0 10 0	0 3 0	0 13 4	1 0 0	0 10 0	..
3. Handling—											
(a) Filling ..	1 12 0	1 8 0	1 0 0	1 9 0	1 12 0	3 2 0	0 12 6	1 9 0	1 2 0	1 8 0	1 9 0
(b) Emptying ..	1 14 0	1 4 0	1 0 0	1 9 0	1 14 0	1 9 0	0 11 0	0 12 6	1 4 0	1 9 0	1 9 0
4. Depreciation on bags ..	0 10 0	0 10 0	0 10 0	*6 4 0	0 10 0	0 10 0	*6 4 0	*6 4 0	0 10 0	0 10 0	*6 4 0
Total cost ..	12 6 0	15 10 0	9 0 0	19 0 0	10 14 0	13 7 0	11 14 6	17 6 10	9 0 0	11 13 0	15 10 0
†Cost per month for 250 maunds ..	2 1 0	2 9 8	1 8 0	3 2 8	1 13 0	2 3 10	2 15 7	4 5 9	2 4 0	1 15 6	3 14 6
Cost per maund per month ..	0 0 1-6	0 0 2	0 0 1-2	0 0 2-4	0 0 1-4	0 0 1-7	0 0 2-3	0 0 3-3	0 0 1-7	0 0 1-5	0 0 3

* At Sargodha, Muzaffarnagar, Shamli and Patna storage in bags is a common practice but particularly so at the first and last named markets.

† The average storage period for the Punjab and Sind markets has been reckoned as 6 months and that for the United Provinces and Bihar markets as 4 months.

APPENDIX XL.

Cost of storing 250 Mds. of wheat in pits (khattis) in some of the most important markets of the United Provinces.

Items.	Kachcha.							Pakka.			
	Hapur (750).	Chazia- bad (600).	Muzfar- nagar (250).	Shamli (250).	Deoband (250).	Sikund- rabad (350).	Hathras (550).	Randa (650).	Muzaffar- nagar (cement concrete) (450).	Chandani (Brick lined) (600).	Deolband (Brick lined) (350).
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1. Rent ..	2 0 0	4 12 9	8 8 0	4 0 0	2 13 9	7 8 0	6 4 0	3 12 0	15 0 0	7 8 0	3 9 3
2. Lining (Material) ..	0 8 0	1 0 8	2 0 0	1 12 0	1 8 0	1 0 0	2 0 9	1 14 9	0 2 0	4 3 0	1 0 0
3. Handling. —											
(a) setting and filling the lining ..	0 4 6	1 1 0	2 0 6	1 9 0	0 14 3	0 8 0	0 12 0	1 3 1	1 1 0	1 2 0	0 14 3
(b) Emptying ..	1 5 0	2 12 6	1 13 6	1 8 0	2 9 0	1 9 6	1 14 0	1 15 3	1 3 0	1 14 0	2 9 0
4. Municipal Tax ..	2 5 4	..	..	..	3 9 2	..	..	..	..	..	3 9 2
5. Miscellaneous ..	0 3 6	0 1 9	0 10 0	0 12 9	0 1 9	0 4 6	1 3 3	0 1 9	0 10 0	0 10 0	0 1 9
Total cost [†] ..	6 10 4	9 12 8	13 0 0	9 9 9	11 7 11	10 14 0	12 2 0	8 14 10	18 0 0	15 5 0	11 11 5
†Cost per month for 250 maunds ..	0 13 3	1 3 7	1 14 0	1 3 3	1 7 0	1 5 9	1 8 3	1 1 10	2 4 0	1 14 7	1 7 5
Cost per maund per month in pice (gross)	-6	-9	1-4	-9	1-1	1-0	1-2	-9	1-7	1-5	1-1

NOTE.—Figures in brackets give the capacity (in maunds) of an average sized *Khatti*.

* Rs. 3-12-0 in the case of more than one year old *Khattis*.

† Average storage period has been taken as 8 months.

APPENDIX XII.

*Costs of storing wheat at Muzaffarnagar.**(A).—250 maunds for an average period of 8 months.*

	Pits.		Kothas.	
	Concrete.	Kachcha.	In bulk.	In bags.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1. Rent	15 0 0	8 8 0	8 0 0	8 0 0
2 Lining (material) .. .	0 2 0	2 0 0	0 6 0	0 3 0
3. Handling (setting the lining, filling and emptying).	2 4 0	3 14 0	1 7 6	1 7 6
4. Depreciation on bags, etc. .	0 10 0	0 10 0	0 10 0	6 4 0
Total storing charges ..	18 0 0	15 0 0	10 7 6	15 14 6
5. Loss in storage .. .	..	..	(a) 15 10 0	(b) 31 4 0
6. Discount for moisture and deterioration in quality.	..	(c) 19 8 6	(d) 3 14 6	(e) 7 13 0
Total ..	18 0 0	34 8 6	30 0 0	54 15 6
Less for gain in weight ..	(f) 3 2 0	(g) 12 8 0	..	..
Total net cost .. .	14 14 0	22 0 6	30 0 0	54 15 6
Cost per maund per month (pies) ..	1.4	2.1	2.9	5.3

See footnotes on next page.

APPENDIX XLI—*contd.*

(B).—250 maunds for an average period of 4 months.

	Pits.		Kothas.	
	Concrete.	Kachcha.	In bulk.	In bags.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
(1 to 4). Storing charges	18 0 0	15 0 0	^(h) 6 7 6	^(h) 11 14 6
5. Discount for moisture and deterioration in quality.	⁽ⁱ⁾ 15 10 0	^(e) 7 13 0	^(j) 11 11 6
Total	18 0 0	30 10 0	14 4 6	23 10 0
6. Less for gain in weight	^(k) 1 9 0	^(l) 9 6 0	^(l) 9 6 0	^(g) 12 8 0
Net cost	16 7 0	21 4 0	4 14 6	11 2 0
Cost per maund per month (pies) ..	1·6	2·0	·5	1·1

Unless otherwise specified the percentages in the footnotes below refer to the quantity stored and wheat has been valued at an average harvest price of Rs 2-8-0 per maund.

NOTES—

- (a) @ 2½ per cent. (mostly by weevil and rats).
- (b) @ 5 per cent.
- (c) @ Re. 0-1-3 per maund (based on actuals).
- (d) @ 3 pies per maund.
- (e) @ 6 pies per maund.
- (f) @ ½ per cent. (average of actuals).
- (g) @ 2 per cent. (average of actuals). No gain has been discounted for 8 months storage as this disappears after the end of the monsoon in the shape of dryage.
- (h) Rs. 4 have been deducted for 4 months rent.
- (i) @ Re. 0-1-0 per maund.
- (j) @ Re. 0-0-9 per cent.
- (k) @ ¼ per cent.
- (l) @ 1½ per cent.

APPENDIX XLII.

Approximate net returns on investment holding of wheat in certain big markets in the surplus districts.

Market.	Average April prices 1931-35.	Premiums over the April price. (5 years average).					Cost of carrying per maund per month.				Total cost for the average storage period.	Average rise in price during the clearing period.	Net profit.
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Khattis or kothas.	Loss and deterioration in storage.	Interest at 8%.	Total.		
	Ra. a. p.	as. p.	as. p.	as. p.	as. p.	as. p.	as. p.	Pies.	Pies.	Pies.	Pies.	as. p.	%
Hapur (Khattis).	2 3 4	3 11	4 9	5 1	5 4	5 5	5 2	0 60	1 00	2 85	4 45	5 4	6.6*
Chandansai—													
(a) Khattis ..	2 6 6	2 10	4 2	5 4	5 6	6 11	8 1	1 50	1 15	3 07	5 72	6 10	7.8*
(b) Kothas ..	2 6 6	2 10	4 2	5 4	5 6	6 11	8 1	1 70	1 63	3 07	6 45	4 1	5.1†
Lyallpur ..	2 2 2	0 11	1 10	3 5	4 11	4 10	3 8	1 50	1 75	2 73	5 98	4 5	4.1‡
(Kothas).													
Amritsar ..	2 4 8	2 5	4 6	3 8	5 0	4 0	5 5	1 00	1 75	2 88	6 23	4 3	3.2†
(Kothas).													
Okara ..	2 1 4	—(0 5)	1 0	2 5	4 7	4 3	2 10	1 30	1 75	2 63	5 71	3 9	2.7‡
(Kothas).													

* The storage period has been reckoned to be 8 months and the average rise in prices is based on the three main clearing months (December, February).

† The storage period has been reckoned to be 4 months and the average rise in prices is based on the three main clearing months (September, November).

‡ The storage period has been reckoned to be 6 months and the average rise in prices is based on the three main clearing months (November, January).

APPENDIX XLIII.

Approximate end of the month at stocks at major ports.

(Thousand tons.)

—	April.	May.	June.	July.	Aug.	Sept.	Oct.	Novr.	Decr.	Jan.	Feb.	Mar.
<i>Karachi.</i>												
1932-33	10.4	14.4	34.0	50.2	48.4	37.5	21.1	12.6	6.2	4.3	..	..
1933-34 .. ..	..	25.6	63.0	75.9	64.2	43.7	36.2	25.5	15.5	11.8	6.4	6.3
1934-35 .. ..	..	30.7	96.7	111.3	128.6	99.5	71.1	37.3	39.3	30.7	23.0	20.3
<i>Bombay.</i>												
1933-34	14.7	20.3	17.7	20.4	16.7	13.7	10.1	11.5	15.8	12.0	9.6	9.3
1934-35	9.0	18.2	21.6	45.2	41.2	33.3	27.7	36.9	32.6	24.4	21.3	16.7
<i>Calcutta.</i>												
1933-34	21.2	20.4	17.6	12.3	13.1	12.1	4.6	5.7	5.8	6.5	2.8	7.8
1934-35	7.1	10.7	13.7	25.2	20.2	40.7	47.0	46.0	39.0	47.3	49.6	42.3
<i>Total stocks.</i>												
1933-34	35.9	66.3	98.3	108.6	94.0	69.5	50.9	42.7	37.1	30.3 ¹	18.8	23.4
1934-35	16.1	59.6	132.0	181.7	190.0	173.5	145.8	120.2	110.9	102.4	93.9	79.3

APPENDIX XLIV.

Imports and exports of wheat by rail and river into and from the different trade blocks of India during 1919-20 and from 1933-34 to 1935-36.

(In thousand tons.)

	Imports.				Exports.					
	1919-20.	1933-34.	1934-35.	1935-36.	Average 1933-34/ 1935-36.	1919-20.	1933-34.	1934-35.	1935-36.	Average 1933-34/ 1935-36.
Assam ..	.4	.7	.5	.6	.6	.4	.02	.01	.03	.02
Bengal ..	3.4	28.0	6.7	5.7	13.5	8.0	1.3	.4	.18	.6
Bihar and Orissa ..	7.3	30.8	41.7	28.8	33.8	19.1	8.9	4.3	10.7	7.9
United Provinces ..	24.8	37.9	65.8	111.7	71.8	157.1	170.5	77.6	73.3	107.1
Punjab ..	7.2	21.8	22.2	23.1	22.3	364.6	193.6	325.1	332.6	283.8
Sind and British Baluchistan ..	71.5	2.0	3.0	5.0	3.3	3.3	153.2	188.4	136.2	159.3
C. P. and Berar ..	36.6	11.2	4.5	19.7	11.8	17.5	56.7	65.6	92.9	71.7
Bombay ..	126.7	83.4	77.1	77.0	79.2	8.8	23.0	14.7	22.9	20.2
Madras ..	3.6	12.0	11.4	12.9	12.1	0.4	0.2	0.2	0.2	0.2
Rajputana ..	50.1	44.2	26.5	21.7	30.8	15.0	17.8	25.7	17.9	20.4
Central India ..	5.0	2.0	1.3	0.3	1.2	34.6	90.0	71.3	117.2	92.8
Nizam's territory ..	17.5	2.3	2.6	0.5	1.8	0.5	0.9	1.8	2.3	1.7
Mysore ..	1.5	13.6	13.8	14.3	13.9	0.05	0.05	0.03	0.09	0.05
Kashmir ..	0.01	0.3	1.0	1.2	.8	..	..	..	..	..
Calcutta ..	133.5	132.6	98.7	150.5	127.2	2.4	1.3	3.0	1.4	1.9
Bombay Ports ..	135.4	67.7	80.8	114.8	87.8	59.2	3.6	3.7	2.2	3.2
Karachi ..	80.4	232.2	326.2	226.0	261.5	15.7	0.1	0.1	0.04	0.1
Madras Ports ..	2.2	1.1	1.1	1.4	1.2	0.7	2.5	3.1	3.5	3.0
Total ..	707.1	723.8	784.9	815.3	774.7	707.1	723.7	785.0	813.6	774.0

Adapted from the 'Accounts relating to rail and river-borne trade of India'.

APPENDIX XLV.
Trade (rail and river-borne) in wheat between different provinces, Indian States, and chief ports in India.
 Average for the years 1933-34 to 1935-36.
 (Hundred tons.)

Whence exported.	Imported into provinces, excluding sea port towns, into States and Chief Port Towns.																		Total.
	Assam.	Bengal.	Bihar and Orissa.	United Provinces.	Punjab.	Sind and Baluchistan.	Central Provinces and Berar.	Bombay.	Madras.	Rajputana.	Central India.	Hyderabad (Nizam's territory).	Mysore.	Kashmir.	Calcutta.	Bombay P. rt.	Karachi.	Madras Port.	
Assam	2.2	1.1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11.4
Bengal	..	10.3	..	32.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	79.4
Bihar and Orissa	..	79.8	203.0	..	..	..	..	15.8	1.8	12.5	..	..	..	..	..	9.2	..	..	1,071.8
United Provinces	1.5	21.7	57.0	437.1	211.8	32.7	..	62.8	..	234.6	..	..	1.1	8.5	535.3	329.4	1,070.6	2.6	2,839.8
Punjab	1.5	4.8	..	..	1.5	..	32.0	..	..	..	..	..	9.9	1,644.1	..	1,593.8
Sind and British Baluchistan.	12.0	3.3	5.9	9.2	21.3	..	113.2	257.4	..	3.7	718.5
Central Provinces and Berar.	..	3.3	59.2	180.9	..	..	8.5	..	55.1	5.1	..	2.6	44.5	..	..	84.9	..	1.1	201.8
Bombay	1.8
Madras	2.6	166.9	..	..	4.4	..	3.3	..	..	12.1	1.8	..	204.4
Rajputana	105.9	464.0	10.7	20.2	..	64.3	..	..	..	174.3	..	3.3	928.0
Central India	1.8	..	..	..	..	..	..	..	1.5	..	..	17.3
Nizam territory
Mysore
Kashmir
Calcutta
Bombay Port	2.6	14.0	1.8	..	..	..	..	31.3	..	..	..	..	..	..	..	..	..	..	18.8
Karachi	31.7
Madras Port	26.5	..	..	..	3.7	..	..	..	..	..	30.2
TOTAL	6.3	134.3	337.9	718.7	224.1	33.1	118.1	791.9	121.1	307.7	11.4	17.3	139.7	8.5	1272.8	878.7	2,616.5	11.8	7,749.9

APPENDIX XLVI.

Shipment of wheat by sea from Karachi to coastal ports in India.
(Tons).

	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Annual Total.
1932-33—													
Bengal ..	1,942	1,507	7,480	17,865	21,412	7,138	17,329	2,197	1,058	227	70	..	79,125
Bombay ..	3,381	2,438	5,457	7,687	7,510	7,827	4,777	4,260	4,295	4,096	303	782	53,153
Madras ..	92	305	686	87	84	61	305	108	222	308	121	108	2,487
Burma ..	..	169	532	..	376	1,714	132	132	..	..	46	..	2,969
Cutch, Kathiawar ..	536	1,165	45	127	359	299	428	408	197	162	109	87	4,012
Goa ..	17	1	..	3	..	1	4	7	2	2	..	1	38
Total ..	5,968	5,635	14,200	25,969	27,741	17,040	22,975	7,070	6,674	4,795	739	978	141,784
1933-34—													
Bengal ..	38	952	5,221	7,406	7,399	6,727	3,004	4,311	658	508	..	..	36,224
Bombay ..	3,090	8,311	6,997	12,384	6,245	5,105	4,155	7,136	4,508	2,919	3,272	4,862	68,984
Madras ..	143	356	275	129	247	178	230	187	294	349	429	91	2,908
Burma ..	..	815	637	567	662	658	658	462	488	332	185	81	5,072
Cutch, Kathiawar ..	168	1,036	245	111	430	806	667	653	720	646	357	341	6,180
Goa ..	..	1	1	4	..	..	1	2	2	4	10	8	33
Total ..	3,439	11,471	13,376	20,601	14,616	13,368	8,715	12,751	6,070	4,758	4,253	5,383	119,401
1934-35—													
Bengal ..	28	1,432	5,390	20,272	10,670	32,438	22,933	13,964	2,913	7,931	2,946	25	120,951
Bombay ..	4,257	5,509	8,313	17,343	4,703	2,324	4,802	14,267	776	482	1,243	721	64,740
Madras ..	304	336	218	540	275	218	206	234	316	252	347	161	3,407
Burma ..	100	595	1,183	1,708	1,500	953	998	921	312	46	333	93	8,742
Cutch, Kathiawar ..	449	1,566	311	129	625	689	799	826	383	499	495	452	7,223
Goa ..	9	1	3	14	10	8	4	37	21	8	8	13	136
Others ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	5,147	9,439	15,427	40,006	17,783	36,630	29,742	30,249	4,721	9,218	5,372	1,465	205,199

Certain particulars in regard to grain trading associations

Name of Association and Province.	Unit of transaction.	Margin money (per bag).	Principal sources of revenue (Commission).	Profit and Loss.	Dividends (1934-35).
	Mds.	Rs. a. p.	Rs. a. p.		%
PUNJAB.					
AMRITSAR.					
The Amritsar Produce Exchange, Ltd.	500	0 8 0	0 2 0 per contract.	Net Profit Rs. 39,022.	30
The Traders' Guarantee Trust Co., Ltd.	500	0 8 0	0 2 6 per contract.	Rs. 29,639	30
LAHORE.					
The Lahore Grain Merchants Co., Ltd.	500	0 8 0	0 10 0 per 500 maunds.	Net Profit Rs. 14,676.	15
LYALLPUR.					
The Indian Brothers Trading Co., Ltd.	270	1 8 0	0 4 0 per cent.	Net Profit Rs. 5,421.	15 1935-36.
The Shan Sunder Trading Co., Ltd.	270	1 8 0	0 4 0 † per cent.	Rs. 16,800	20 1935-36.
OKARA.					
The Bharat Krishna Trading Co., Ltd.	250	1 4 0	0 8 0 † per cent.	..	..
GOJRA.					
The Bar Central Trading Co.	250	1 0 0	0 4 0 per cent.	..	15
The Gojra Union Trading Co.	250	1 0 0	0 4 0 ‡ per cent.	Net Profit Rs. 12,016.	100
The Satyawani Trading Co. ..	250	1 4 0	0 4 0 per cent.	..	..
TORA TEK SINGH.					
The Gopalkrishna Trading Co., Ltd.	250	1 0 0	0 6 0 per cent.	..	..
TANDLIANWALA.					
The Tandlianwala Central Trading Co.	250	1 0 0	0 6 0 per cent.	..	..
The Sandal Bar Trading Co., Ltd.	250	0 12 0	0 5 0 per cent.	..	..
JARANWALA.					
The Jaranwala Lakshmi Trading Co., Ltd.	250	1 0 0	0 3 0 per cent. Shareholder to pay Rs. 50 per annum per share.	Rs. 6,900	27.6
The Jaranwala Pratab Trading Co.	250	1 4 0	0 3 3 per cent.	..	..
ARIFWALA.					
The Nilibar Trading Co. ..	250	1 4 0	0 12 0 per cent.	..	..
SARGODHA.					
The Swedesh Trading Co. ..	500	1 4 0	0 4 3 per cent.	..	50

DIX XLVII.

or produce exchanges in India.

Names of commodities dealt.	Volume of trading in wheat.	Futures contracts settled by actual deliveries.	% of deliveries to total volume of trading.	Remarks.
	(Tons).	(Tons).		
Wheat, gram, toria, sugar, cotton seed and cotton.	1933-34 9,715,936 1934-35 8,412,443 1935-36 7,853,157	62,647 40,938 37,445	0.6 0.5 0.5	
Do. ..	1934-35 5,401,982 1935-36 5,091,979	3,934 5,128	0.07 0.1	
Wheat and gram ..	1933-34 1,318,511* 1934-35 711,176* 1935-36 539,136	.. 4,301 4,117	.. 0.60 0.76	* Includes gram.
Wheat, gram, toria, sugar, bardana and cotton seed.	.. ..	.. ..	.. ..
Do. ..	1933-34 153,840	5,940	3.8	† Non-members are charged commission at Re. 0.8-0 percent. The total charges in this case amount to Re. 0.9-0 per cent.
Wheat, gram, toria, cotton-seed and cotton.	.. ..	.. ..	.. ..	† The exchange retains commission only 0.1-9 per Rs. 100.
Wheat, gram, toria, cotton-seed, bardana and cotton.	.. ..	.. ..	.. ..
Wheat, gram, toria, cotton-seed, sugar, oil bags.	.. ..	.. ..	.. ..	‡ Rebate on commission paid to members. In 1936 this amount was Rs. 3,796.
Wheat	1933-34 43,860 1934-35 44,185	129 129	0.29 0.29	
Wheat, gram, toria, sugar, oil, gunny bags, cotton and cotton-seed.	1933-34 11,167 1934-35 11,242	478 481	4.28 4.28	
Wheat, gram, cotton-seed, oil cake, sugar, toria, bags and cotton.	1933-34 21,994 1934-35 21,663 1935-36 13,143	.. ..	.. ..
Wheat, gram, cotton-seed, sugar and gunny bags.	1933-34 14,651 1934-35 22,371 1935-36 34,672	.. ..	.. ..
Wheat, gram, toria and oil, cotton-seed.	1933-34 50,232 1934-35 45,558 1935-36 34,720	1,259 1,627 1,048	2.51 3.57 3.02	
Wheat, gram, toria, cotton-seed, sugar and oil.	1933-34 26,082 1934-35 36,146 1935-36 26,210	1,222 1,231 ..	4.68 3.40 ..	
Wheat, gram, toria, cotton-seed and cotton.	1933-34 63,106 1934-35 63,574	1,553 1,565	2.46 2.46	
Wheat, gram, toria, bags and cotton-seed.	.. ..	.. ..	.. ..

Name of Association and Province.	Unit of transaction.	Margin money (per bag).	Principle sources of revenue (Commission).	Profit and Loss.	Dividends (1934-35).
	Mds.	Ra. a. p.	Ra. a. p.		%
BAHAUDDIN. The Bahauddin Trading Co., Ltd.	250	0 12 0	0 2 9 per cent.	..	..
PHULLERWAN. The Phullerwan Trading Co., Ltd.	250	0 8 0	0 3 0 per cent.	..	..
JULLUNDUR. The Jullundur Trading Co., Ltd.	250	0 8 0	0 5 0 per cent rebate @ 0-1-0 upto 500 contracts in a year and 0-2-0 over 500.	..	..
The Bhisam Trading Co., Ltd.	250	0 8 0	Do.	Net profit Rs. 2,719.	12
MOGA. The Grain Trading and Bank- ing Co., Ltd.	250	0 8 0	..	Rs. 3,500	15
LUDHIANA. The Grain and Cotton Mer- chants Co., Ltd.	250	0 10 0	0 3 0 * per cent.	..	..
FAZILKA. The Mahadev Business Co., Ltd.	250	0 8 0	0 1 3 † per cent.	..	..
Ferimal Bros. and Co. ..	250	0 8 0	1 0 0 per 100= bags (250 mds.).	..	..
MUKTSAR. The Muktsar Trading Syndi- cate, Ltd.	250	0 8 0	..	..	..
BHATINDA. The Krishna Co., Ltd. ..	250	..	0 3 6 per 100 bags.	Net profit Rs. 9,144.	74
DHURI. The Ganesh Beopar Bhandar, Co., Ltd.	250	..	0 2 0 per cent.	Net profit Rs. 495.	..
BARNALA. The Mahabir Tijarat Bhandar, Ltd.	250	..	0 1 6 per cent.	..	..
The Beopar Bhandar, Ltd. ..	250	..	0 1 6 per cent.	..	..
NARNAUL. The Marwari Chamber of Com- merce.	250	..	0 1 6 per 100 maunds.	Net profit Rs. 3,400. No. of shares 250 of Rs.100 each.	..
The Aggarwal Chamber of Com- merce, Ltd.	250	..	..	..	..

DIX XLVII—contd.

Names of commodities dealt.	Volume of Trading in wheat.		Futures contracts settled by actual deliveries.	% of deliveries to total volume of trading.	Remarks.
	(Tons).		(Tons).		
Wheat, gram, toria sugar, cotton and cotton-seed.	1933-34 1934-35	20,607 20,759	..	..
Do. ..	1933-34 1934-35	41,222 41,528	579 583	1.1 1.4	
Wheat, gram, cotton-seed and sugar.	1933-34 1934-35	718,898 724,209	937 944	0.1 0.1	
Do. ..	1933-34 1934-35 1935-36	720,378 328,293 229,834	1,138 490 985	0.15 0.15 0.41	
Wheat, gram and cotton-seed.	1933-34 1934-35 1935-36	153,934 193,136 80,601	61 82 202	0.04 0.04 0.25	
Wheat, gram, cotton and cotton-seed.	..	..	..	..	* 0.1-0 per contract is charged as rebate which is later on refunded to members only.
Wheat, gram, barley, guara and cotton-seed.	1935-36	40,259	92	0.23	† Rebate @ Rs. 10 per Rs. 100 of commission is given to those who record a minimum business of 10,000 bags annually.
Do. ..	1934-35	5,000	Nil.	..	
Wheat, gram, guara and cotton-seed.	1933-34 1934-35	10,064 10,138	27 27	0.26 0.26	
Do. ..	1934-35 1935-36	245,075 424,230	395 1,562	0.16 0.36	
Wheat, gram, barley, guara and cotton-seed.	1934-35 1935-36	62,201 40,001	.. ..	.. ..
Wheat, gram, barley, guara, cotton-seed and <i>sarson</i> . ‡	1934-35 1935-36	50,950 277,223	.. ..	.. ..	‡ Rape seed.
Do. ..	..	..	..	..
Wheat, gram, guara, <i>bayra</i> , cotton-seed, yarn, sugar and oil seeds.	..	..	..	..
Do. ..	..	..	..	..

Name of Association and Province.	Unit of transaction.	Margin money (per bag).	Principle sources of Revenue (Commission).	Profit and Loss.	Dividends.
	Mds.	Rs. a. p.	Rs. a. p.		%
SONEPAT. The Sonapat Vaish Trading Co., Ltd.	125	0 10 0	Commission and interest.	..	72 (1933-34.) 32 (1934-35.) 68 (1935-36.)
The Sukh Sagar Trading Co Ltd.	125	0 10 0	Do.	..	250 (1933-34.) 300 (1934-35.) 20 (1935-36.)
UNITED PROVINCES.					
HAPUR.					
The Chamber of Commerce ..	25 tons.	Rs. 150 per 25 tons.	1934-35 Commission Rs. 4,780.	Rs. 1,840	..
The Mahabir Vyopar Mandal ..	200	..	..	..	..
The Grain Merchants' Association.	25 tons.	..	..	..	..
GHAZIABAD.					
The Krishna Beopar Mandal	600	Rs. 150 per 600 mds.	0 2 0 per contract.	..	..
The Ghaziabad Chamber of Commerce.	200	..	Do.	..	..
MEERUT.					
The Kaisergunj Vyopar Co. ..	250	..	..	..	..
MUZAFFARNAGAR.					
The Grain Chamber, Ltd. ..	200	Rs. 50 per 200 mds.	..	Rs. 6,726 (net).	..
SAHARANPUR.					
The Grain Chamber, Ltd.	..	..	Rs. 11,915	Rs. 7,225 (net).	..
DEORAND.					
The Beopar Mandal ..	325	..	Rs. 1,036	Rs. 160 Profit.	..
CHANDAULI.					
The Chamber of Commerce ..	12½ tons.	Rs. 100 per 12½ tons.	1934-35 Rs. 719 @ 0-5-0 per contract	Rs. 1,363	..
MORADABAD.					
The Moradabad Trading Co., Ltd.	..	..	Rs. 4,775	Rs. 4,672 (net).	..
BAREILLY.					
Beopar Mandal ..	..	..	..	..	..
HATHRAS.					
Sr Gopal Chamber, Ltd. ..	..	..	Rs. 4,775 @ 0-8-0 per contract.	Rs. 1,086	..
SIKANDRABAD.					
Sikandrabad Merchants, Ltd.	..	..	..	..	..

DIX XLVII—*contd.*

Names of commodities dealt.	Volume of trading in wheat.		Futures contracts settled by actual deliveries.	% of deliveries to total volume of trading.	Remarks.
	(Tons).		(Tons).		
Wheat, gram, rapeseed and gur.	1935-36	18,768	150	.80	
Do. ..	1935-36	12,673	..	..
Wheat, gram, barley, peas, arhar.	1933-34	5,488,250	(a)	..	
	1934-35	2,933,400	(a)	..	
	1935-36	125,750	(a)	..	
Do. ..	1933-34	303,066	(a)	..	
	1934-35	260,441	(a)	..	
	1935-36	143,014	(a)	..	
Do. ..	1935-36	3,931,025	(a)	..	
Wheat, sugar, cotton, ghee, etc.	1934-35	470,000	8,824	1 87	
..	
..	1933-34	368,607	..	..
	1934-35	538,500	..	..
	1935-36	197,864	..	..
..	1933-34	2,001,778	..	..
	1934-35	1,947,518	..	..
	1935-36	972,740	..	..
..	
..	1933-34	207,239	..	..
	1934-35	84,806	..	..
	1935-36	53,076	..	..
..	1933-34	179,249	1,486	0.83	
	1934-35	94,136	1,074	1.14	
	1935-36	25,336	1,137	4.49	
..	
..	1935-36	291,210	1,160	0.4	
..	
..	1935-36	125,779	..	..

Name of Association and Province.	Unit of transo- tion.	Margin money (per bag).	Principle sources of Revenue (Commission).	Profit and Loss.	Dividends.
	Mds.	Rs. s. p.	Rs. s. p.		%
BULANDSHAHR.					
The Bulandshahr Prem Co., Ltd.	..	..	..	..	..
The Baran Vyopar Mandal, Ltd.	..	..	..	..	..
PORTS.					
KARACHI.					
The Karachi Indian Merchants Association.	25 tons.	Nil.	Membership fee. Delivery order fee. @ 0-8-0 per order. (c)	..	..
CALCUTTA.					
The Calcutta Grain, Rice and Seeds Association.	10 tons.	..	..	..	..
BOMBAY.					
The Grain Merchants Association.			Ready transactions only.		
The Marwadi Chamber of Commerce, Ltd.	25 tons.	..	..	..	..
Seed Traders Association ..	..	..	..	..	..

(a) Not available.

(b) Calculated estimate on the actual quantity of wheat known to be delivered against futures

(c) For every tender of 25 tons of produce the first tenderer shall pay a registration fee of tender form.

NOTE.—The requisite particulars are not available in respect of the following Asso.

- (1) The Punjab and Sind Traders' Chamber, Ltd., Okara, (2) The Channy Ganesh Beopar (4) Sargodha Trading Co., Ltd., Sargodha, (5) The Baha-uddin Lakshmi Trading Rajkumar Banking and Commercial Co., Ltd., Muktesar, (8) The Anabala Chamber of Commercial Association, Aligarh, (11) The Ganesh Vyopar Mandal, Ltd., Kasganj

DIX XLVII—*concl.*

Names of commodities dealt.	Volume of Trading in wheat.	Futures contracts settled by actual deliveries.	% of deliveries to total volume of trading.	Remarks.
	(Tons).	(Tons).		
..	
..	
Wheat, barley, gram, toria, cotton-seed, rapeseed.	1934-35 15,000,000 1935-36 ..	38,225 48,750	0.25 ..	
Wheat, linseed ..	1934-35 3,000,000	..	..
All produce .. ..	.. ..	..	..
Wheat, linseed ..	934-35 8,000,000(b)	41,800	0.5	
..	

rules.

Re. 0 8 0. Each succeeding tenderer shall pay Re. 0-8-0 for each of his contracts entered on the

ciations :—

Co., Ltd., Mian Channu, (3) The Kailash Arifwala Trading Co., Ltd., Arifwala, Co., Ltd., Bahi-uddin, (6) The Moga Commercial Banking Co., Ltd., Moga, (7) The Commerce, Ltd., Ambala, (9) Chandausi Vyopar Mandal, Ltd., Chandausi, (10) The and (12) Brij Vyopar Mandal, Ltd., Muttra.

APPENDIX XLVIII.

Costs of distribution between certain important wheat markets.

(Per standard maund.)

NOTE.—Figures in brackets show percentage of consumer's price.

	Lyalpur to Karachi.	Lyalpur, Karachi, Bombay.	Lyalpur, Karachi, Calcutta.	Lyalpur to Calcutta.	Chandani to Calcutta.	Hapur to Delhi.	Indore to Bombay.	Sagor to Bombay.	Arifwala to Delhi.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Cultivator's price*	2 3 3 (66.7)	2 3 3 (60.1)	2 3 3 (58.9)	2 3 3 (58.6)	2 7 3 (69.0)	2 7 5½ (83.2)	2 10 4 (67.0)	2 5 7½ (63.1)	2 3 0 (68.5)
Assembling charges, paid by the seller ..	0 0 9 (1.4)	0 0 9 (1.3)	0 0 9 (1.2)	0 0 9 (1.2)	0 0 9 (1.2)	0 0 6½ (1.0)	0 1 8 (2.6)	0 1 5½ (2.6)	0 1 0 (1.9)
Wholesale price (Assembling markets) ..	2 4 0 (68.1)	2 4 0 (61.4)	2 4 0 (60.1)	2 4 0 (59.8)	2 8 0 (70.2)	2 8 0 (84.2)	2 12 0 (69.6)	2 7 2 (65.7)	2 4 0 (70.5)
Costs (F. O. R.) incurred by the buyer in assembling market.	0 2 9 (5.2)	0 2 9 (4.7)	0 2 9 (4.6)	0 2 9 (4.5)	0 2 3 (3.7)	0 2 6 (5.3)	0 2 3 (3.5)	0 2 10 (4.8)	0 1 10 (3.6)
Railway freight	0 11 10 (22.4)	0 11 10 (20.2)	0 11 10 (19.8)	1 0 4 (27.3)	0 10 6 (17.5)	0 1 0 (2.1)	0 12 0 (19.1)	0 12 11 (21.7)	0 8 6 (16.7)

Handling, etc., at Karachi	..	..	0 1 10	0 1 10	..	..	..	..	..	..	..
			(3-1)	(3-0)							..
Steamer freight	..	..	0 1 9	0 2 11	..	..	..	..	..	..	..
			(3-0)	(4-9)							..
Refraction differences	..	†	§	§	..	..	..	..	..	..	..
Wholesalers costs at the centres.	Consuming	0 2 0	0 1 9	0 2 3	0 2 6	0 2 6	0 1 3	0 1 11	0 1 11	0 1 11	0 1 3
		(3-8)	(3-0)	(3-8)	(4-1)	(4-2)	(2-6)	(3-0)	(3-2)	(3-2)	(2-4)
Margin	..	†	0 0 6	0 0 6	0 0 10	0 0 10	0 0 6	0 0 9	0 0 6	0 0 6	0 0 6
			(.8)	(.8)	(1-4)	(1-4)	(1-0)	(1-2)	(.8)	(.8)	(.9)
Wholesale price (Consuming market)	..	3 2 10	3 8 5	3 10 2	3 10 5	3 10 3	2 13 3	3 12 11	3 9 4	3 9 4	3 0 0
		(96-2)	(96-2)	(97-0)	(97-1)	(97-0)	(95-2)	(96-4)	(96-2)	(96-2)	(94-1)
Retailing costs		0 2 0	0 2 3	0 1 9	0 1 9	0 1 9	0 2 3	0 2 3	0 2 3	0 2 3	0 3 0
Retail margins	..	(3-8)	(3-8)	(3-0)	(2-9)	(3-0)	(4-8)	(3-6)	(3-8)	(3-8)	(5-9)
Consumers price	..	3 4 10	3 10 8	3 11 11	3 12 2	3 12 0	2 15 6	3 15 2	3 11 7	3 11 7	3 3 1

* (Inclusive of transportation charges to the assembling market).

† No figure for margin is shown as this is covered by the gain in weight which goods carried down from the Punjab and Sind always realise.

‡ Difference in basis accounts for 3 per cent to be deducted from Karachi price.

§ No differences.

APPENDIX

Number of transactions and volume of business relating to wheat recorded

Association.	April.	May.	June.	July.	August.
1933-34.					
PUNJAB—					
1. <i>Amritsar—</i>					
(a) The Amritsar Produce Exchange, Ltd.	31,334	47,720	35,008	55,139	71,798
(b) The Traders Guarantee Trust Co., Ltd. .. .. .	..	..	..	..	..
2. <i>Jullundur—</i>					
The Bhusham Trading Co. ..	6,056	9,192	7,049	10,452	13,093
UNITED PROVINCES—					
3. <i>Hapur—</i>					
(a) The Mahabir Vyapar Mandal ..	1,286	3,513	2,974	6,767	9,425
(b) The Chamber of Commerce ..	7,773	17,329	9,435	20,341	30,512
4. <i>Other Associations</i>	604	2,004	2,160	6,751	12,024
Total	47,053	79,758	56,624	99,450	136,852
1934-35.					
PUNJAB—					
1. <i>Amritsar—</i>					
(a) The Amritsar Produce Exchange Ltd.	36,009	44,214	33,978	35,977	40,295
(b) The Traders Guarantee Trust Co., Ltd.	26,344	30,909	25,783	23,373	25,269
2. <i>Jullundur—</i>					
The Bhisham Trading Co. ..	3,344	4,762	2,861	2,735	2,578
UNITED PROVINCES—					
3. <i>Hapur—</i>					
(a) The Mahabir Vyapar Mandal ..	2,067	2,376	2,212	3,151	4,563
(b) The Chamber of Commerce ..	16,634	21,107	19,122	17,591	21,252
4. <i>Other Associations</i>	7,683	13,915	13,829	14,340	16,539
Total	92,081	117,283	97,785	97,667	110,496
1935-36.					
PUNJAB—					
1. <i>Amritsar—</i>					
(a) The Amritsar Produce Exchange, Ltd.	28,774	24,397	24,643	26,502	30,749
(b) The Traders Guarantee Trust Co., Ltd.	25,118	22,096	19,460	22,004	23,213
2. <i>Jullundur—</i>					
The Bhisham Trading Co. ..	997	1,072	1,269	1,654	2,243
UNITED PROVINCES—					
3. <i>Hapur—</i>					
(a) The Mahabir Vyapar Mandal ..	2,233	2,080	1,135	1,402	3,065
(b) The Chamber of Commerce ..	1,528	2,164	401	14	71
4. <i>Other Associations</i>	4,277	6,238	8,081	6,550	16,331
Total	62,927	58,047	54,989	58,126	75,877

XLIX.

by certain grain exchanges in 1933-34 to 1935-36.

Septem- ber.	October.	Novem- ber.	Decem- ber.	January.	February.	March.	Total.	
							Number of Transac- tions.	Tonnage.
50,709	55,075	26,418	38,428	37,849	33,050	45,514	528,040	9,715,936
..
6,732	6,390	3,834	4,688	3,784	5,257	1,775	78,302	720,378
4,073	4,404	2,922	1,911	1,564	1,456	922	41,217	303,066
15,125	18,295	22,616	14,976	45,561	10,853	6,714	219,530	5,488,250
6,971	7,149	6,152	8,235	7,738	6,022	3,268	545,944	5,405,031
83,610	91,313	61,942	68,238	96,496	56,638	58,193	1,413,033	21,632,661
38,922	32,452	29,100	47,135	48,108	40,209	30,804	457,203	8,412,443
23,200	19,772	19,119	26,958	27,164	24,172	21,529	293,592	5,401,982
4,370	1,884	1,074	3,756	3,598	2,034	1,778	35,674	328,293
5,646	2,801	1,619	3,604	2,843	2,248	2,290	35,420	270,441
7,627	2,284	2,780	2,095	2,626	1,863	1,455	117,336	2,973,400
19,383	7,321	5,219	9,033	16,832	9,192	5,649	139,435	31,443,871
99,148	66,514	59,811	93,481	101,171	79,718	63,505	1,978,660	48,760,430
35,536	61,543	41,034	50,694	34,973	38,200	30,762	427,807	7,853,157
26,731	38,342	21,595	25,665	18,629	18,268	15,593	276,744	5,091,979
2,803	4,247	3,304	2,429	2,566	1,515	878	24,982	229,834
2,301	2,424	1,177	949	1,060	1,055	569	19,450	143,014
55	..	..	..	..	..	797	5,030	125,750
15,945	26,498	14,266	15,177	10,241	8,494	5,980	403,357	7,138,666
83,371	133,054	81,376	94,914	67,469	67,532	54,679	1,247,370	20,582,400

APPENDIX L.

Settlement dates, conditions and points of delivery at certain grain trade associations.

Associations.	Submission of tenders (rules affecting sellers and buyers).	Due date.	Points of delivery.
Indian Merchants Association, Karachi.	On the first and last working day of the delivery period and on every Tuesday, Thursday and Saturday after 1 P.M. except on due date when it can be tendered after 2 P.M.	(a) For contracts specifically for Railway Receipt, one week after the last day of the period. (b) For contracts providing for delivery to be completed within a specified period, the last day of the period.	Thole Produce Yard, Kiari and City.
The Amritsar Produce Exchange, Limited, Amritsar.	(i) Seller's option from 16th of the month preceding the due date up to 23rd up to 4 P.M. on working days, buyer's option from 24th up to the last day of the month up to 4 P.M. on working days. On due date up to 12 noon both sellers and buyers can exercise their options. (ii) Seller's option from 1st to 7th of <i>Har</i> , buyer's option from 8th to 14th upto 4 P.M.; on 15th <i>Har</i> both buyers and sellers can exercise their option upto 12 noon.	15th of <i>Har</i> (June-July) and last of all other months specified.	Town.
The Lyallpur Sham Sunder Trading Company, Limited, Lyallpur.	(i) "Delivery Orders" can be issued by the seller from the 1st to 15th 2 P.M. of the month specified. (ii) "Letter of Demand" to be issued by the buyer from 16th to 20th of the month specified for the balance of contracts found on 15th of the month.	..	..
The Bharat Krishna Trading Company, Limited, Okara.	The buyer or seller can demand or issue delivery order at any time between the 15th and 2 P.M. on the 20th of the month of settlement.	Five days after issue of the "Delivery Order" or the receipt of the "Letter of Demand."	Town.
The Gojra Union Trading Company, Limited, Gojra.	Seller's option up to 24th of the month of settlement. Buyer's option on 25th of the month of settlement.	Last day of the month specified.	Town.
The Partap Trading Company, Limited, Jaranwala.	Seller's option up to 22nd of the month of settlement. Buyer's option after 22nd to the last day of the month of settlement.	Last day of the month specified. ..	Market. ..

APPENDIX L—contd.

Settlement dates, conditions and points of delivery at certain grain trade associations—contd.

Association.	Submission of tenders (rules affecting sellers and buyers).	Due date.	Points of delivery.
The Grain and Cotton Merchants Company, Ladhiana.	Seller's option :—		
	(i) From 1st to 12 Noon on the 7th <i>Har</i>.	..	..
	(ii) Other months—16th to 12 Noon 23rd of the month preceding due date.		
	Buyer's option :—		
	(i) <i>Har</i> —8th to 12 Noon 14th <i>Har</i> .	15th of <i>Har</i> and 1st of all other months specified.	Town.
	(ii) Other months—24th to 12 noon on the last day of the month preceding the due date.		
	Buyer's and Seller's option :—		
	(i) Upto 12 noon on 15th <i>Har</i>.	..	..
	(ii) Upto 12 noon on 1st day of all other months.		
The Chamber of Com- merce, Hapur.	Seller's option : <i>Badi</i> 1 to <i>Sudi</i> 10 (approximately the first 25 days) of the month of settlement.	..	..
	Buyer's option : <i>Sudi</i> 1 to <i>Sudi</i> 12 (approximately from 16th to 28th) of the month of settlement.	<i>Sudi</i> 15 or the last day of the month specified in the con- tract.	Town.
The Chamber of Com- merce, Chandansai.	Seller's option : <i>Badi</i> 1 to 12 noon on <i>Sudi</i> 10 (approx- imately the first 25 days) of the month of settlement.	<i>Sudi</i> 15 or the last day of month specified in the contract.	Town.
	Buyer's option : <i>Sudi</i> 13 (28th day) of the month.		
The Grain Chamber, Limited, Muzaffar- nagar.	Sellers' option : From <i>Badi</i> 1 to 12 noon on <i>Sudi</i> 10* (ap- proximately the first 25 days) of the month of settle- ment.	Do.	..
	<i>Sudi</i> 1 to <i>Sudi</i> 10 (16th to 25th).		New Market.
The Beopar Bhandar, Limited, Barnala (Patiala State).	Not available.		
The Ganesh Beopar Bhandar Company, Limited, Dhuri (Patiala State).			

* Upto *Sudi* 15 for pit wheat.

APPENDIX L—concl'd.

Settlement dates, conditions and points of delivery at certain grain trade associations—concl'd.

Associations.	Submission of tenders (rules affecting sellers and buyers).	Due date.	Points of delivery.
The Marwari Chamber of Commerce, Limited, Bombay.	Sellers' option: upto 1 P.M. on 1st and all Mondays, Wednesdays and Fridays occurring between the 1st and last day of the month and upto 1-30 P.M. on due date or the last day of the month.	Last day of the month of settlement.	Within the Municipal limits.
The Calcutta Rice, Grain and Seeds Association, Calcutta.	Buyer's and seller's options: 10th to last day of the month of settlement.	1st day of the month following the month of settlement.	Howrah or Kidderpore docks.
The Swedesh Trading Company, Limited, Sargodha.	Buyer's and seller's option: up to 20th.	..	Town.

APPENDIX LI—*contd.**Prices of wheat and products at Karachi 1933-35.*

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.	Ra. a. p.
1933.												
Wheat ..	3 12 6	3 13 8	3 12 10	3 7 2	3 2 2	3 3 7	3 6 3	3 1 4	2 14 7	2 11 9	2 13 9	2 12 10
Seji ..	..	..	..	..	..	..	4 9 11	4 4 0	4 1 6	3 13 4	3 15 10	4 2 9
Superfine flour ..	..	..	..	..	..	..	4 6 6	4 1 6	4 0 8	3 11 7	3 14 2	4 1 1
Household flour ..	..	..	..	..	..	..	4 1 6	3 13 4	3 11 7	3 6 7	3 9 1	3 12 0
Ata No. 1 ..	..	..	..	..	..	..	4 3 2	3 15 0	3 13 4	3 8 3	3 10 9	3 13 9
Ata No. 2 ..	..	..	..	..	..	..	3 10 9	3 7 0	3 3 5	3 4 1	3 5 9	3 6 2
Ata No. 3 ..	..	..	..	..	..	..	3 9 1	3 5 9	3 2 5	3 2 5	3 4 1	3 4 6
Bran ..	..	..	..	..	..	..	1 14 10	1 11 11	1 11 11	1 15 3	1 13 5	1 13 5
1934.												
Wheat ..	2 11 8	2 12 5	2 10 5	2 7 7	2 10 8	2 11 7	2 10 7	2 11 10	2 10 4	2 9 3	2 10 8	2 14 0
Seji ..	3 11 7	3 15 10	3 12 5	3 10 4	3 10 9	3 10 9	3 12 5	3 14 2	3 12 5	3 13 4	3 12 5	3 14 2
Superfine flour ..	3 5 9	3 15 0	3 10 9	3 11 2	3 11 2	3 12 5	3 12 5	3 15 0	3 13 4	3 14 2	3 13 4	3 15 0
Household flour ..	3 4 9	3 9 11	3 5 9	3 6 2	3 8 3	3 7 5	3 7 5	3 10 9	3 9 1	3 9 11	3 9 1	3 10 9
Ata No. 1 ..	3 6 9	3 11 7	3 7 5	3 7 10	3 9 11	3 9 1	3 9 1	3 12 5	3 10 9	3 11 7	3 10 9	3 12 5
Ata No. 2 ..	3 2 5	3 4 1	2 15 0	2 15 10	3 2 5	3 2 5	3 2 5	3 0 8	3 0 8	3 0 8	3 1 11	3 4 9
Ata No. 3 ..	3 0 8	3 2 5	2 13 4	2 14 2	3 0 8	3 0 8	3 0 8	2 15 0	2 15 0	2 15 0	3 0 3	3 3 3
Bran ..	1 9 9	1 9 9	1 9 9	1 9 9	1 12 8	1 14 1	1 11 2	1 12 8	1 14 10	1 15 7	1 13 5	2 0 4
1935.												
Wheat ..	3 1 1	2 14 9	2 10 6	2 13 0	2 14 0	2 13 2	2 12 7	2 12 10	2 14 2	3 2 7	3 2 11	3 2 4
Seji ..	4 4 10	3 15 0	3 12 5	3 12 5	3 12 5	3 11 7	3 9 11	3 11 7	4 1 6	4 15 3	4 5 8	4 0 3
Superfine flour ..	4 5 8	3 15 10	3 14 2	3 13 9	3 12 0	3 12 0	3 12 10	3 12 5	4 3 2	4 15 3	4 5 4	4 0 3
Household flour ..	4 1 6	3 11 7	3 9 9	3 9 6	3 9 1	3 7 10	3 7 10	3 8 3	3 14 7	4 13 3	4 3 2	3 15 10
Ata No. 1 ..	4 3 2	3 13 4	3 11 7	3 11 2	3 10 9	3 9 9	3 9 6	3 9 11	4 0 3	4 14 11	4 4 10	4 1 6
Ata No. 2 ..	3 9 11	4 1 6	3 2 5	3 3 8	3 5 4	3 5 4	3 2 3	3 4 1	3 8 8	4 0 8	3 7 5	3 7 10
Ata No. 3 ..	3 8 3	3 15 10	3 0 8	3 1 11	3 4 1	3 3 8	3 1 6	3 2 5	2 7 0	3 15 0	3 5 9	3 6 2
Bran ..	2 1 10	2 0 4	1 15 7	1 14 10	1 15 7	2 0 4	1 14 10	1 14 1	2 3 3	2 5 6	2 1 10	2 1 10

APPENDIX LII.

Average monthly wholesale prices of masida and ata.
(Per maund of 82 2/7 lbs.)

Year.	Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Average.
BOMBAY.													
<i>Masida Export</i> No. 2—	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.	Ra. A. P.
1931	5 9 1	5 2 5	4 13 9	4 10 10	4 8 1	4 5 9	4 4 6	4 4 11	4 2 10	4 3 3	4 11 3	5 3 3	4 10 8
1932	5 1 1	4 15 5	4 11 8	4 9 11	4 10 10	4 12 6	4 15 0	5 7 5	5 8	5 10 3	5 8 3	5 8 3	5 1 11
1933	5 9 6	5 8 10	5 7 4	5 2 7	5 1 1	5 0 8	5 2 2	4 15 5	4 12 6	4 10 10	4 14 2	4 12 6	5 1 6
1934	4 10 10	4 12 1	4 8 9	4 7 6	4 9 2	4 8 4	4 8 4	4 7 11	4 11 8	4 7 6	4 7 6	4 8 9	4 8 7
1935	4 11 2	4 10 10	4 8 4	4 9 2	4 8 9	4 7 11	4 8 4	4 9 2	4 11 3	5 2 5	5 4 11	5 1 1	4 10 8
1936	5 0 8	5 0 1	4 15 5	4 13 8	4 12 6	4 12 0	5 0 8	5 9 2	5 6 5	5 9 6	5 7 10	5 11 3	5 2 11
BOMBAY.													
<i>Ata No. 2—</i>													
1931	3 3 4	3 1 8	3 1 8	3 1 8	3 0 6	2 14 3	2 12 11	2 13 5	2 11 9	2 11 9	3 3 4	3 11 8	3 0 8
1932	3 12 1	3 10 10	3 7 1	3 4 7	3 3 4	3 4 2	3 7 6	4 3 8	4 3 3	4 4 0	4 2 5	4 2 5	3 12 1
1933	4 5 9	4 7 6	4 7 0	4 2 3	3 13 5	3 9 2	3 10 4	3 8 9	3 9 7	3 10 0	3 15 11	3 8 1	3 14 4
1934	3 6 8	3 7 11	3 5 10	3 3 9	3 3 9	3 2 6	3 3 4	3 3 9	3 2 6	3 2 6	3 2 11	3 4 7	3 4 2
1935	3 5 0	3 7 6	3 5 0	3 5 10	3 5 5	3 5 9	3 6 10	3 6 8	3 8 3	3 12 11	3 13 5	3 8 4	3 7 6
1936	3 9 2	3 10 0	3 10 10	3 9 7	3 8 4	3 8 0	3 12 6	4 3 10	4 0 10	4 4 1	4 3 8	4 5 7	3 13 10
CANWATORE (UNITED PROVINCES).													
<i>Masida (Household).</i> No. 2—													
1932	..	..	..	3 8 6	3 4 0	3 3 0	3 10 0	4 6 6	4 11 0	4 10 0	4 10 0	4 8 0	4 1 4
1933	4 9 0	4 12 0	4 10 0	3 14 0	3 14 0	4 0 0	3 15 0	4 0 0	3 12 0	3 11 6	3 12 6	3 11 6	4 12 0
1934	3 8 0	3 11 0	3 9 0	3 8 0	3 9 6	3 9 0	3 8 0	3 9 0	3 10 6	3 10 0	3 10 0	3 9 6	3 9 3
1935	3 14 0	3 15 0	3 11 0	3 12 0	3 9 0	3 13 0	3 13 0	3 12 0	3 12 0	3 16 0	4 2 0	3 14 6	3 13 3

APPENDIX LIII.

Bye-Laws for the inspection and proper regulation of bakeries.

Under Sections 188 (e) (i) and 199 (i), Punjab Municipal Act, 1911, Approved by the Chief Commissioner *vide* his Notification No. 4951-Education, dated 26th July 1915.

1. For the purpose of these Bye-laws "Bakery" means any place in which bread, biscuits or other such food of a European type is prepared or baked for sale.

2. No privy, ash-pit, or drain shall be allowed within or shall communicate with a bakery.

3. No drain or pipe for carrying off sullage water or sewage shall have an opening within a bakery.

4. All the inside walls, and all the ceiling or roofs of a bakery whether plastered or not, and all passages and stair-cases within a bakery, shall be lime-washed at least once in every 6 months, and more often if the Health Officer of the Municipal Committee so directs; and the floor and all kneading troughs, tables and utensils in the bakery shall be thoroughly scrubbed and washed with water daily.

5. No person shall dwell or sleep in a bakery.

6. There shall not be kept inside a bakery any *hookah* or any materials for smoking, or any bedding or soiled clothes or other articles not required for the purpose of the bakery.

7. No person other than employees of the bakery or an inspecting officer of the Municipal Committee shall be allowed to enter a bakery.

8. No animal shall be kept in a bakery.

9. All flour, dough and other material used in preparing the products of a bakery shall be kept in clean receptacles and covered with a clean cover.

10. No person suffering from any contagious or infectious disease or from open sores shall be employed in a bakery.

11. Every bakery shall be open at all reasonable hours to the inspection of any officer of the Municipal Committee appointed in this behalf.

12. Any person who commits a breach of these Bye-laws or abets the commission of such breach, shall, on conviction by a Magistrate, be punishable with fine which may extend to fifty rupees and when the breach is a continuing breach, with a further fine which may extend to five rupees for every day after the first during which the breach continues.

APPENDIX LIV.

Stereo D. A. No. 191.

C.O.
D.A. No. 174.

AGREEMENT.

BETWEEN

The Agricultural Department, Punjab.

Messrs. _____ Commission Agents at Mandi_____.

1. The firm mentioned has been authorised to sell the Department of Agriculture's wheat/cotton seed at the rate fixed by the Department. If seed is supplied to purchasers in bags, the commission Agents/Firm are/is authorised to make an additional charge on account of the price of such bags.

2. The firm agrees not to sell any other wheat/cotton seed and to arrange satisfactory godowns for the seed.

3. The registers and other necessary accounts shall be kept in Urdu, and shall always be kept up-to-date. They shall be available for checking at any time by the Officers of the Agricultural Department.

4. The firm will be responsible for collection of sale proceeds and for carrying out all other instructions relating to storage and disposal of seed.

5. The Department will pay a commission of _____ annas per maund on the seed issued for sowing purposes and will pay ordinary Mandi dues on any quantity not sold for sowing purposes, but sold off in open market. No Commission will be paid on quantities transferred to other firms.

6. The firm shall settle accounts promptly when the seed has been disposed of.

7. The Commission Agents/Firm shall pay interest at the rate of 2 per cent per mensem if they fail to pay the money to the Department at call. Interest will be calculated on the money collected and not paid at call.

8. The Department reserves the right to forfeit whole or part of the commission earned by the firm in case of breach of any of the above noted conditions.

9. In case of dispute the decision of the Agricultural Officer in charge shall be final.

10. This agreement will remain in force so long as the Commission Agent concerned acts as such or until the agreement is cancelled.

Deputy Director of Agriculture, Punjab_____

Witness _____

Commission Agents:—

Dated the _____ 193 .

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